EXPERT ADVICE AND TIPS FOR EVERY AMIGA ENTHUSIAST

WIN! AN A1200!

AMIGA SHOPPER

From the makers of AMIGA FORMAT

ISSUE 21 ● JANUARY 1993 ● £2.25
YOUR DEFINITIVE AMIGA GUIDE

The best year yet?

INSIDE

• GRAB YOURSELF A 486!

Yep, Vortex's 486 PC emulator is here but just how powerful is it – and is it worth it?

Vortex: Page 40

• TAKE COMPLETE CONTROL

Fifteen pages of expert Amiga solutions to help you master your machine

Amiga Answers: Page 45

SPECIAL DISK ISSUE!

Twelve great utilities for the serious Amiga enthusiast – turn to page 18 now to get your files up and running



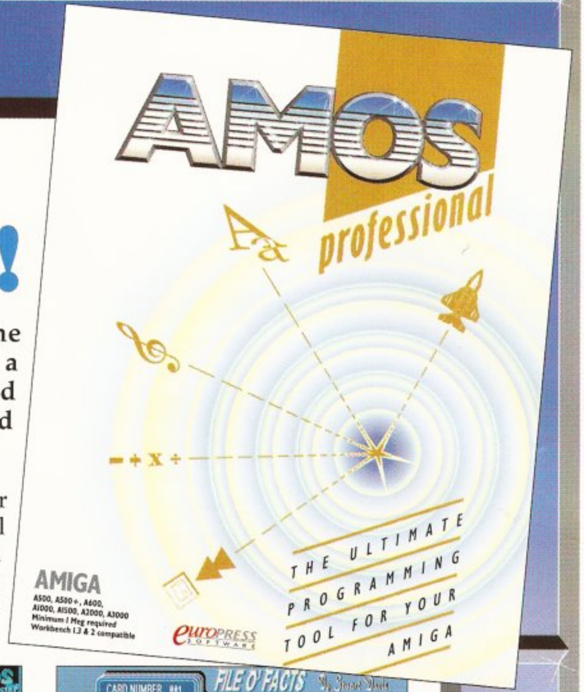
Your guide to all the hot Amiga products of 1992 starts on p25

Well that's just typical! Some kleptomaniac has swiped your cover disk – better tell your friendly newsagent to give you another one pronto

PLUS: Is the A1200 really five times faster than the A600? – we race 'em!

Future PUBLISHING
Your guarantee of value

Now AMOS has turned Professional!

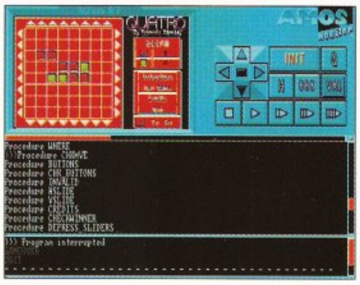


AMOS The Creator has brought programming within the reach of over 50,000 Amiga users. Now it has been given a complete overhaul and the result is a vastly enhanced product – AMOS Professional – designed for all experienced Amiga programmers.

AMOS Professional has 200 new commands, taking the total to over 700. Included in the package is a 650-page manual written by Mel Croucher who wrote the highly-praised Easy AMOS manual, and Stephen Hill who wrote the original AMOS manual. Programs written using earlier versions of AMOS and Easy AMOS can be loaded into AMOS Professional for amendment or enhancement.



Write programs with ease using the feature packed Editor



Track down problems fast in the advanced Monitor Mode

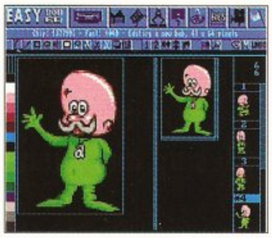


You can get serious too – File O' Facts shows just what's possible

- On-line help provides details of the command at the cursor position – another click takes you to a fully documented working example.
- A new editor with drop-down menus, keyboard macros, advanced undo/redo, and multiple windows on screen.
- IFF animation playback that runs faster than in DPaint.
- MED music library support with MIDI data send, Noise Tracker support, easier access to the printer, serial and parallel ports and much more.
- MOUTH commands to link sprites to speech output from the SAY command to create a realistic talking head.
- Two discs crammed with working examples, and tutorials demonstrating AMAL, the new AMOS Interface system, collision detection and other key topics.
- A selection of new highly-finished programs, including Planet Zybex (a scrolling shoot'em up), File O'Facts (electronic data organiser), Quatro (puzzle game) and Dithell's Wonderland (an eight-way scrolling platform game).

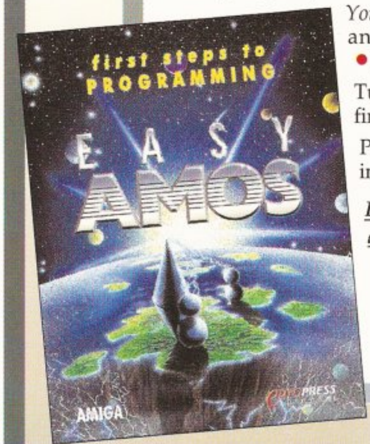
The result is a package which will more than satisfy home and professional AMOS users. It's fun to use, lots to learn – it's essential for the Amiga.

An easy introduction...



Create eye-catching animations with the powerful Bob Editor

If you're a complete beginner to programming you can make your Amiga really work for you! Easy AMOS is a simplified, ultra-friendly version of the best-selling AMOS Basic programming language, and it will propel you into a fascinating world.



You will learn how to: • Produce impressive graphical effects • Create and animate colourful objects • Scroll large text across the screen • Make your Amiga actually talk • Add music to your creations

Turn your ideas into reality – arcade games, adventures, computer art, cartoon animations, home finance, educational software, demos… the list is endless!

Packed with ready-to-run programs, you can quickly understand how they work, and use the ideas in your own programs. There's a 20-lesson course to take you through the steps of programming.

Easy AMOS's step-by-step and fun approach is the simplest and easiest route to writing your own software.

EASY AMOS REQUIRES 1 MB OR MORE OF RAM AND THREE BLANK DISCS. AMOS PROFESSIONAL REQUIRES 1MB OR MORE OF RAM. TO UPGRADE TO AMOS PROFESSIONAL CONTACT DATABASE DIRECT ON 051 357 2961. AMOS PROFESSIONAL AND EASY AMOS ARE STOCKED BY MOST COMPUTER SOFTWARE RETAILERS.

europress SOFTWARE
Europa House, Adlington Park,
Macclesfield SK10 4NP
Tel: 0625 859333 Fax: 0625 879962

AMIGA SHOPPER AT A GLANCE GUIDE

To help you find what you want quickly and easily, this is a cross-referenced list of all the products and subjects covered in this month's *Amiga Shopper*. The subjects covered in Amiga Answers are detailed on page 45; the many PD programs covered on page 155 are listed there. The page numbers given are for the first page of the article in which the product is mentioned.

Are there any products or subjects you'd like us to take a look at? Well, just drop a line to:

Amiga Shopper,
30, Monmouth Street,
Bath BA1 2BW.

WELCOME

So that's another year then eh? But what a year for the Amiga. 1992's seen the A600, the A570, the A1200 and the A4000 - not a bad output for a company accused of resting on its laurels!

As we said in no uncertain terms last issue, the A1200 has got to be the best thing that's happened to the Amiga range since 1985. So we've put it head to head with an A500 to see just how much faster it really is. I think you may be surprised by the results. Neverthless, it's a great machine and one which we'll be giving significant coverage to in the year ahead.

But of course, Commodore hardware is only half the story of 1992 – there's also the wealth of new software and third-party peripherals that's been brought to market during the same period. Which is why we've devoted nine pages to selecting the best from the rest in the main areas of Amigadom. Use it as a buyer's guide if you wish, or deem it an informed overview of our experts' favourite goodies – either way it's a handy reference to the best Amiga products around.

The other significant item in this issue you will have more than probably noticed is the cover disk. What you have is a disk that's packed with the very latest PD and shareware from the States – and we hope you'll find them useful. But don't get the wrong idea here – we're not going to fill it full of demos and overrated PD wares in future; we just want to bring you the best in free utilities and look at ways in which we can turn it into an interactive tutorial device. And no, we won't be going over to full colour glossy pages and upping the price.



Just one other thing, this is my last issue. Cliff takes the chair from here on in, as I'm off to launch a new magazine. So thanks for your support and see you around. Enjoy the ish, (and the disk) and byeeeeee...

Andy Storer

Editor

PUBLIC DOMAIN WORLD

DISKZINE DELIGHTS

There are thousands of Amiga programs which are available for little more than the price of a disk. And many more which allow you to try the software free before you buy. Each month in Public Domain World we examine the best of these programs and explain how to get hold of them.

This month we focus on a multimedia World War II simulator (- you better believe it!), a Tchaikovsky Nutcracker Suite disk, a crossword cracker and the world's worst database. Public Domain World or

no better mag than this

as we call it this month, starts on page 155

AMIGA ANSWERS

13 PAGES DEVOTED EXCLUSIVELY TO ANSWERING YOUR QUESTIONS

Every month in Amiga Answers our panel of experts answer more genuine reader questions than any other Amiga magazine. And for beginners our easy Expert Tips will help you get to grips with your Amiga, and understand the other features in this month's issue.

We answer questions every month on Workbench • The CLI • Comms • Programming • DTP • Video • Business software • and more.

THE ANSWERS START ON PAGE 45

FOR A FULL LIST OF CONTENTS, TURN THE PAGE



AMIGA A1200 PACKAGE £389

Our A1200's are also available with fully prepared and formatted internal IDE hard disk drives. Please add the following prices for the size of the disk drive that you require:-

20MB	£110
40MB	£180
120MB	£260
240MB	£450
330MB	£580
426MB	£880

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Please add £6.00 for postage & packaging
Please make all cheques/P.O.s payable to **SOFTWARE DEMON LTD.**, if applicable please include your credit card № and expiry date.

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INSIDE THIS ISSUE

AMIGA SHOPPER
Issue 21 January 1993

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So how about winning another year's free subscription? This time it's all about neo-futurist film noir Blade Runner - Ready?...right - What was the name of the nightclub where the oh so sexy skin job and her snake used to work? You got it? Then just its name on a card to: 'Cor, that Priss was well worth a run-in', Amiga Shopper, 30, Monmouth St, Bath, BA1 2BW. First out the bag wins 12 free issues . Oh, and last ish's winner was Mrs. C.G. 'Anthony Perkins' Bennett of Sheffield. Smart!







Supra ROM upgrade

Amiga hardware manufacturer Supra has announced the availability of a ROM upgrade for owners of its SupraFAXModem v32.

Said John Wiley, Supra's president: "We are committed to our customers and want them to be able to experience the benefits of improvements we have made since the product was originally released last February." First and foremost among these benefits is a fix to make the product work as it should.

The modem will now, when using a v32bis connection, fall back to a lower communications speed when confronted with a bad connection. Similarly, it will increase its speed when the connection improves.

A couple of new features are also included on the ROM. The first is Error Correction Mode (ECM), which enables error-free faxes to be sent with software that supports the ECM protocol. The other is a Silent Answer feature, enabling the same line to be used for both voice and fax. If fax tones are detected by the modem, then it will respond; otherwise it will remain silent and enable the user to answer the call.

To decide whether or not you need the upgrade, you should issue the 'AT13' command to your modem. If the ROM part number returned is lower than 1.2H or 1.2J then you need the upgrade.

It is available by calling the Supra BBS ☎ 010 1 503 967 2444, or by writing to: ROM Upgrade, Supra Corporation, 7101 Supra Drive SW, Albany, OR 97321, USA.

MAJOR MULTI-PURPOSE EMULATOR SYSTEM LAUNCHED

American company Utilities Unlimited has released an emulator system that offers compatibility with all major computer systems.

Called Emplant, the system uses both hardware and software to emulate the Mac II series of computers. But the unique innovation of Emplant is its ability to emulate just about any computer with the addition of software and the computer's ROMs. Plans are afoot to provide emulation for the IBM PC 386 and 486, the top of the range Mac Quadra, the Atari Mega ST and Falcon, and the Commodore 64.

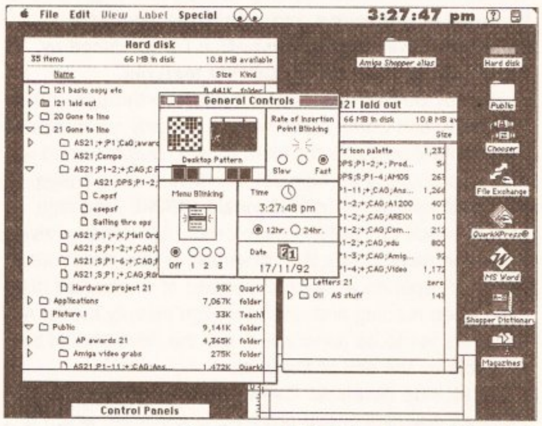
Emplant's hardware has been designed not only to emulate existing technology but to cater for future advances too. In the case of the Mac, its basic architecture, including timers, interrupts and clocks, is handled on a hardware level. The board will support EPROM, Static RAM and SIMM modules to cater for the various formats used to store computer operating systems.

Emplant comes as a Zorro card to slot into an A2000 or A3000. An alternate version is available to slot into the expansion bus of an A500 or A1000. It will work with all of the above Amigas, but a 68030 processor with a memory management unit is recommended for the best compatibility and speed. Users must purchase their own Macintosh ROMs.

The system will multitask alongside the Amiga, and is compatible with various 24-bit boards including IV24 and Rambrandt.

Emplant is available as a basic system for £184.95, or with high speed serial ports and AppleTalk support for £219.95. Another version of Emplant is available with a high speed SCSI interface, also for £219.95, or it may be bought with both Apple Talk and a SCSI interface for £249.95.

Emplant is manufactured by Utilities Unlimited ☎ 0101 602 680 9004 and distributed in the UK by Blitz Soft ☎ 0908 666265.



If you need Macintosh emulation but can't afford a Mac, then Emplant could be just what you're looking for

AMIGA BOOKS

Bruce Smith Books has added another two books to its *Mastering Amiga* range: Phil South's *Master Amiga – AMOS* for £19.95 and *Mastering Amiga Workbench 2*, for £19.95. Bruce Smith Books can be contacted on ☎ 0923 894355.

PARALLEL PORT VLAB RELEASED

The Amiga Centre Scotland has announced it is to sell the latest version of Macro System's Vlab.

Vlab is a high-speed video frame-grabber, previously only available as a plug in Zorro II card. It can now be plugged into the Amiga's parallel port, making it useable with any Amiga. It costs £381.88.

The company has also announced price drops on its 24-bit graphics boards, starting at £875 for the Harlequin 1500 model. Call ☎ 089 687 583 for more details.

PANDAAL'S NEW SCAN SOFTWARE

Version 3 of the *DaataScan Professional* software package for Pandaal's hand scanner has now been released.

Its new features include a dual screen layout with both a main screen and a 16-level grey scale one; the ability to convert from dithered to grey scale images; a brightness control; two levels of zoom; drawing tools; text entry; and support for all Workbench printer drivers.

The software is compatible with all Amigas and versions of Workbench. It's available as an upgrade to existing users for £20.

Call Pandaal International ☎ 071 328 1717 for more information.

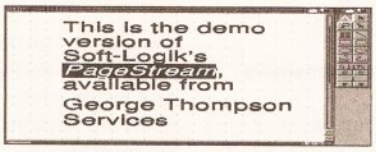
GTS BECOMES OFFICIAL USER GROUP FOR SOFT-LOGIK

Soft-Logik, maker of the *PageStream* desktop publishing package, has appointed George Thompson Services as an official user group.

GTS, primarily a public domain library, has gained considerable renown as a supplier of high quality software and fonts. It will be providing product support for *PageStream* users, as well as advice on more general Amiga subjects. Joining the *PageStream* user group will cost £15 per annum. For this price, members also get the chance to buy hardware and software at discounted prices, are eligible for savings on public domain titles, and have access to Adobe Type 1 fonts and a large range of GIF graphics files. They will receive copies of *Megadisc* and *Jumpdisk*, two disk-based magazines.

GTS is also selling a demo version of *PageStream*. Costing only £5.99, the package will give users the chance to try out the package before investing. It is slightly crippled: there is no save facility and a 'demo' message is included with all output.

Call George Thompson Services ☎ 0707 271117 for more information.



Soft-Logik's *PageStream* is a powerful but expensive DTP package, but now you can try before you buy with the demo version from GTS

PRICE DROP FOR SIMPATICA

Videographers will be pleased to hear that Optonica's Simpatica system has had its price reduced from £1173.83 to £350.

Simpatica, reviewed in issue 1, is a hardware/software system that will render graphics to videotape one frame at a time. Sophisticated frame by frame editing features are supported by the package, enabling complex 24-bit animations to be created and played back in real-time.

The latest version of the product supports fast image imports, and multi-serial cards. It also has ARexx support, enabling it to be controlled via ASDG's *Art Department Professional*.

For more information call Optonica ☎ 0455 558282.

Commodore wows crowds at Future Entertainment Show

People were carrying A1200s out by the box-load at November's Future Entertainment Show. Commodore's stand was inundated not only with people eager to see its brand new machine, but also those staring in disbelief at the new demonstration CD produced by Psygnosis to show off the CDTV's features.

Nearly 60,000 show-goers turned up throughout the four days, and Commodore wasn't the only manufacturer with exciting products for them to see. Dutch company KCS was showing its high density drive for the Amiga, which will operate in both standard (880Kb) and high density mode (1.76Mb). Unlike other high density drives which run more slowly than standard drives, the models from KCS operate at twice the speed of a standard disk drive when reading and writing in high density mode. A price has yet to be announced, but the drive should be available by the end of the year.

Stateside developer GVP was demonstrating its *ImageFX* graphics image processing software, which is capable of speedily manipulating 24-bit pictures in many varied ways, including ripple and oil painting effects.

Clarity 16, a 16-bit sound sampler that features stereo input and output, was on display at Microdeal's stand. This incredible unit provides CD quality sound for only £149.95. Expect a review soon. Also on display from Microdeal was VideoMaster, an easy-to use video digitiser/ sound sampling package that enables users to create their own mini-movies. Images are monochrome, or up to 4096 colours if the hardware is used in conjunction with a colour splitter. VideoMaster costs £69.96.



Despite Andy Storer's challenge of a free drink for anyone asking an unanswerable question, the *Amiga Answers* team handled every problem sent their way

Thanks to all who came, and if you didn't, why not? See you at Olympia next year for an even bigger show.

MCGRAW-HILL VIRTUALLY TIES UP GRAPHICS BOOK MARKET

Two new books set for release by publisher McGraw-Hill should appeal to graphics and virtual reality fans.

Virtual Reality – Through The New Looking Glass by Kevin Teixeira and Ken Pimental concerns itself with giving the layperson an easy-to-read guide to the emerging technology and imagery of virtual reality. *Virtual Reality – Through The New Looking Glass* contains 264 pages and will cost £26.95.

Also of interest is Peter Sorensen's £40.50 *The Life Of Computer Graphics*. This 240 page tome covers the background to computer graphics as well as providing information on state-of-the-art technology and speculation on graphics in the future. It also includes topics on virtual reality and the exciting combination of artificial intelligence with animation.

McGraw Hill Book Company Europe ☎ 0628 23432.

GREEN MULTIMEDIA TAKES ROOT

Applied Research Kernel is to release a comprehensive multimedia package dealing with plants.

Plants For All Seasons comes on 10 floppy disks. It currently holds information on 1000 different plants, along with 100 HAM images. Access to sound, pictures, text and video is provided by multimedia buttons.

Plants For All Seasons comes with a context-sensitive help facility, and also includes a dictionary of horticultural terms which can be called up by clicking on a button from within any page of the database.

Gardeners, botanists and multimedia fans will all enjoy *Plants For All Seasons*



The package currently costs £99.95. Future updates of the database will be available to users for £6 plus VAT and postage. Call Applied Research Kernel ☎ 0983 551 496.

NEW SEAGATE DRIVES

Hard drive manufacturer Seagate has announced a new set of products ranging from 1.8 to 5.25 inches in size.

Perhaps the most interesting of these is the ST7050P, a 42Mb 1.8 inch drive that supports the PCMCIA Type III interface. It comprises a single platter and is no more than 10.5 millimetres in height.

Seagate also announced the ST9295AG/N 2.5 inch drive, which, at 260Mb, is currently the largest capacity drive available for home computers. It is can be supplied with either an AT or a SCSI interface.

You can contact Seagate on ☎ 0628 690366.

AMIGA SHOPPER NEEDS A TECHNICAL WRITER

Amiga Shopper magazine is looking for a full time technical writer to work from its office in beautiful Bath.

The successful candidate will have a sound knowledge of the Amiga market and a good understanding of the machine's hardware and software. A strong grasp of the English language is essential.

The salary is up to £10,000 per annum. If you are interested, send your CV along with a sample of your written work to Cliff Ramshaw at the usual address.

CD-ROM DRIVES FOR ALL

Thanks to Almathera systems, just about any Amiga owner will now be able to use a standard CD-ROM drive as a CDTV.

Commodore has been pipped to the CDTV compatibility post by Almathera System's combination of a Toshiba SCSI CD-ROM drive and CDTV.DEVICE software.

The drive will work with most SCSI controllers, and as such is useable by owners of the A1500/2000/3000 machines with a hard card as well as A500 owners with an A590, GVP or similar hard drive.

The Toshiba drive is a 300ms device – twice as fast as Commodore's CDTV drive. The necessary software is provided by the CDTV.DEVICE program, which provides over 90% compatibility with existing CDTV titles.

As well as turning your Amiga into a CDTV, the device will act as an ordinary Amiga volume (labelled CD0:) or an audio CD player. Three CDs are supplied, including *CDPD Public Domain Collection*, containing Fred Fish disks 1 to 660.

The drive is available as an internal kit for £395; or as an external kit for £495. If you also require a SCSI controller card, add £100 to the price. Almathera Systems ☎ 081 683 6418.

BUBBLE JET FONTS

Ursa Software has released a package to improve output with the Canon BJ10e and BJ10ex printers.

BJ10/130 Fonts is a package which will enable Amiga owners to download soft fonts to their Canon bubble jet printers. Doing so means that they can have access to a wide range of fonts without the need of a desktop publishing or word publishing package. Instead, text-based word processors such as *Protext* can make use of the fonts as if they were internal to the printer.

As well as coming with 16 ready-made fonts, the package has an editor which enables the user to create more of their own.

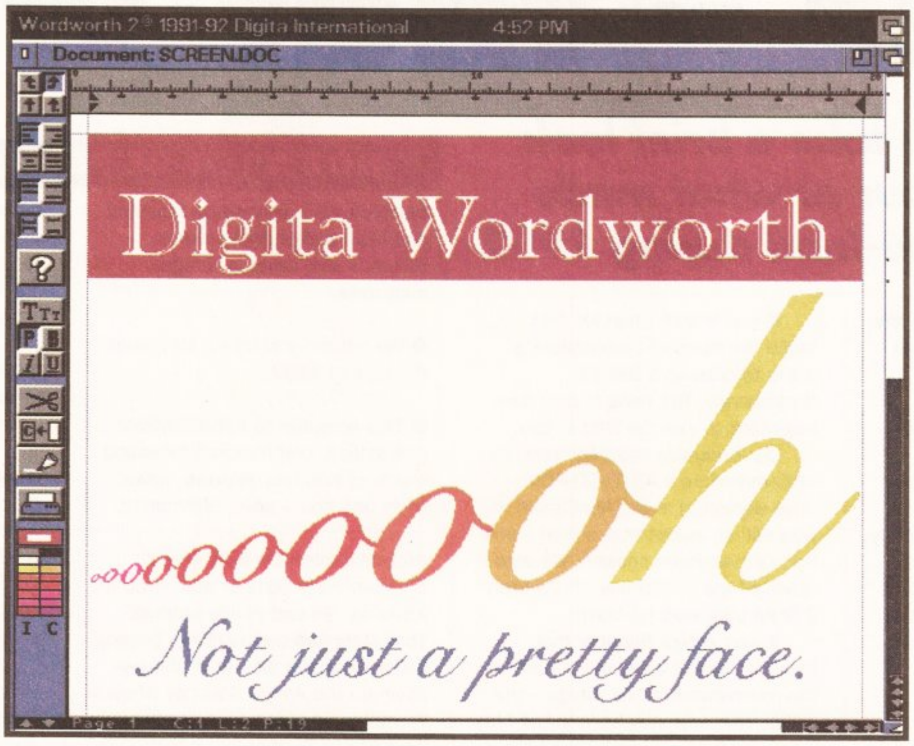
The package costs £10 from Ursa Software, 11 Highwell Gardens, Felling, Tyne & Wear NE10 0NB.

CHEAPER IMAGES

MS Images is selling a collection of its entire range of fonts, borders and backgrounds at a special Christmas price of £10.99. The collection would normally cost nearly £20.

More info from MS Images, 84 Averil Road, Leicester LE2DB.

Actual screen. Not simulated.



If you want to take a closer look at the new Wordworth
call 0395 270273, or write to
Digita, FREEPOST, Exmouth EX8 2YZ ENGLAND

Actually, you're looking at the new Digita® Wordworth® version 2.

It's the revolutionary Intellifont® technology which produces on–screen fonts at sizes from 3 to 800 points!

Wordworth comes with 17 genuine Agfa® Compugraphic fonts, which are just about the best quality around.

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New features include • columns • tool bar • indexing • table of contents • endnotes • improved mailmerge and file support • bookmarks • text sorting • improved search and replace • hotlinks. In fact, there's over 100 new features and improvements.

So, if you want to print the sharpest possible letters around, trade up now from any Amiga word processor for just £59. But hurry, this is for a limited period only.

Digita Wordworth, what you see is what you get—the power to present.

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So, that was the year – that was

...in which we take a brief look back in candour at what made news in Amiga-land during 1992

In retrospect, 1992 seems like the most exciting year for the Amiga since its launch. And *Amiga Shopper*, though we say it ourselves, has had more than its fair share of exclusives.

Here we take a look at the key events that made 1992 such a special epoch in the Amiga's history. We're also giving you a few more light-hearted facts and figures, just for good measure, and to let you know that we don't take the Amiga *too* seriously.

EXCLUSIVE!

January's issue carried the report on the huge World Of Commodore Show. Top exhibitor at the show was undoubtedly GVP, with a stunning range of products, but we were pretty impressed with Ocean's Waltzer stand.

It was March when we first broke the news of Commodore's plans to release a 386SX Bridgeboard. The thing is only now beginning to see the light of day.

Our exclusive two page preview of Commodore's A570 CD-ROM drive appeared in the April issue. It was still so secret that a final name hadn't even been chosen. We also reported the availability of Kickstart 2 ROM upgrades (at last!).

It was *Amiga Shopper* that brought you the exclusive details of the much-awaited new Amiga – the A600. That was way back in the May issue, and it was some time before the Amiga community got the new machine it really wanted.

DEATH OF A LEGEND

July saw the end of the road for the A500 and A500 Plus. In an exclusive interview with *Amiga Shopper* Kelly Sumner described the A500 as 'an end of line product'. That story had our mailbags bulging for months. We also gave the low-down on the *Amiga Shopper Show* at Wembley, at which we thought Progressive Peripherals & Software had by far the best stand (as did just about everyone who turned up – it was next to impossible to get near the stand because of the crowds).

In August we reported that Kelly Sumner was to take over as managing director of Commodore UK. It wasn't until the month afterwards that Commodore would confirm the story. Steve Franklin took a key position in Commodore's multimedia division, before leaving in unclear circumstances after a matter of months.

The first ever interview with Kelly Sumner – new main man at Commodore UK – ran in the September issue. In it he told us that the last days of the A2000 were drawing nigh. A replacement was expected, and Commodore did in fact announce a new machine – provisionally called the A2400 – at a press conference. Nevertheless, it failed to appear and we're all still waiting. Kelly also justified the release of the A600 and the end of the A500, as well as making tantalising hints about a new graphics chip set.

The remarkable £100 price drop on the A600 was reported in October's issue, just a few short month's after its launch. Industry response was generally good, and the move has no doubt helped sell more machines. We also reported the appearance in the USA of an A3000 based around a new '040 processor.

TWO STARS ARE BORN

In November we were there first again – we gave you the full details on the A4000 launch at the World Of Commodore Show at Pasadena. We also revealed exclusive details on Vortex's brand new 486 PC emulator, reviewed this issue.

Last, but by no means least, December's issue saw the unveiling of the A1200. We gave you the full technical specifications, an in-depth analysis of its place in the market, comparison with the competition and comments from the major players in the industry.

What can we say? We bring you the news first, and give you the full background that others can't deliver.

NOT A LOT OF PEOPLE KNOW THIS

In which we reveal some startling and little known facts about Britain's only serious Amiga magazine.

- We printed a startling 12 issues throughout 1992.
- This amounts to approximately one million, one hundred thousand words of tutorials, reviews, news, hints and tips – *solid* information.
- Your 12 issues stacked together will stand 0.102 metres high – you'll need 4,038,950,03 issues stacked together to reach to the moon.
- We've solved around about 750 of your problems over the last year – more than any other Amiga mag.
- Andy Storer is not related to *Eastenders*' Dirty Den.

NEW FEATURES ● NEW FEATURES ● NEW

What lucky people you are! During 1992 we've introduced all of the following regular features, unparalleled in depth and clarity:

- Andy Storer, who took over as editor for the January issue
- Spreadsheet tutorial
- Beginner's guide to programming
- Ten top tips
- Reader's program listings
- The ever-handy product locator
- Artificial intelligence
- Amiga CD
- Artificial genetics
- Chaos and fractals
- Getting to grips with multitasking
- C programming
- Arexx programming

VAPOURWARE CORNER ● VAPOURWARE CORNER ● VAPOURWARE CORNER

In which we take a brief look at those especially exciting products that appealed to us all in a pink, fluffy and moist kind of way, but which nevertheless failed to materialise.

- **The portable Amiga – Newer Technology was all set to release one, but Commodore said 'no'. Perhaps we'll see one in '93?**
- **The A300 console-beater (although it's a fair bet that a simple name change turned it into the A600)**
- **The A800 – not too dissimilar from today's A1200**
- **16-bit sound for any Amiga**
- **Nintendo's rumoured take-over of Commodore – fuelled by New York Stock Exchange speculation**
- **The A2400 – officially announced by Commodore at a press conference, but nevertheless fated never to see the light of day**
- **FMG turning around repaired Amiga within the promised four weeks**

THE AMIGA IN 1995

Commodore revealed its secret plans for the Amiga to a select group of developers at last September's World of Commodore Show in Pasedena. Gareth Carroll reveals the plans ahead for your machine

To an assembled throng of leading American developers, Commodore US outlined its vision of the Amigas of the nineties. It has decided that it will be building the new AGA chipset into the whole range of Amigas in the future. This seems to indicate that the CDTV and the A600 will also sport the new chips at a later date.

This decision is likely to make DCTV, HAM-E and some of the 24-bit graphics boards redundant, but then it may well be the news that many Amiga owners or prospective Amiga owners have been waiting for – because the idea of buying a top end machine with 24-bit graphics capability built in will most certainly appeal to many prospective buyers.

Commodore has now decided to aim at producing two types of machine in the future: low end and high end. Recently we have seen the release of the first of the new range of high end machines – the A4000 and the company is also known to be working on a tower version of the A4000. We've also seen the first of the new low end machines – the A1200.

This machine has practically the same capabilities as the A4000 but works on a slower CPU (A 68020 compared to the A4000's 68040).

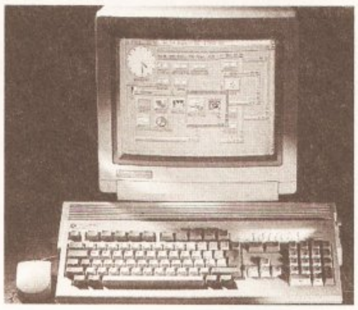
> *"A digital signal processor is expected in six months"*

LOW-END TECH-SPECS

The more transistors a computer has, the faster it can make decisions and carry out instructions. Hence more transistors more power. The future chip set for the low end machines will be made up of two VLSI (Very Large Scale Integration) chips with about 100,000 transistors. Compare this with the 60,000 transistors that the ECS (Enhanced Chip Set) has and the 80,000 that the AGA (Advanced Graphics Architecture) chip set has and you can get a rough idea of just how fast the new chips will be.

These low-end Amigas will incorporate the following features:

- All machines will be able to access 32-bit DRAM (Dynamic Random Access Memory) – this means that the memory can be accessed a lot faster than at present



The A1200 – first of a new range of low-end Amigas – will the next one up will be the 68030-based A2400?

- Floppy drives will be able to write up to 4Mb on a single floppy
- High speed serial ports (for faster sending and receiving of data),
- 57 MHz programmable pixel clock to enable user definable resolutions
- Facility to animate a 16-bit 65,356 colour display from a 24-bit palette of 16.7 million colours
- High speed blitter that can handle large 256 colour screens in a screen refresh mode of 72 Hz – this is twice as fast as the ECS chips in lower screen resolutions.

The best news though is that a main priority in the development of these chips will be to achieve backward compatibility with the ECS and AGA chip sets.

HIGH-END MEGA-SPECS

Commodore plans to put 4 VLSI chips, giving a total of between 800,000 and 1,000,000 transistors, into its top end Amigas. As you can probably imagine, these machines will be very hot indeed. Some of the features of these machines will be:

- Top end machines will feature the same surface mounted technology as with the low end machines
- Programmable pixel clock with rates between 57MHz and 114MHz
- Able to access 32-bit or 64-bit VRAM (Video Random Access Memory). These chips are particularly fast but are currently very expensive, although they will no doubt be a lot cheaper in the future
- Frame grabbing capability will be built in along with graphics compression
- Super fast serial port(s)
- 32-bit blitter (to enable better graphics handling) and 32-bit processor slot (a RISC system has been mentioned)
- 24-bit true colour displays
- 8-channel, 100 KHz, 16-bit audio.
- Expected within 6 months is a DSP (Digital Signal Processor) upgrade for the A4000.

Since the A4000's 68040 is on a daughterboard plugged into the motherboard, processor upgrade is likely to be in the form of a CPU board replacement. The future Amigas will also be fitted with the latest versions of AmigaDOS.

AMIGADOS 4 PLANS

AmigaDOS 3.1 will be able to double buffer intuition screens and swap buffers at a speed of more than 2000 per second. This version will also have printer/file sharing, network extensions and will be able to support the new DSPs.



The A4000 will actually be the entry-level machine for a new range of high end Amigas featuring 32-bit blitters, 24-bit colour displays, 16-bit audio, and DSP chips

It will also be capable of retargetable graphics – this means that the graphics hardware will be able to be changed or added to without having to rewrite the software.

Commodore's own design facilities have now been greatly improved and the company is commissioning much of the manufacturing work to companies like VLSI and HP. The new chips (Alice and Lisa) are being produced by three different companies to avoid any supply problems, although they are designed by Commodore.

CBM has also addressed concerns in the sound department by announcing the DSP upgrade for the A4000. This announcement has confirmed rumours that arose earlier this year when it was reported that the company was having discussions with a major manufacturer to negotiate the rights to use its DSP.

> *"the best news is that the new chips will be backwards compatible"*

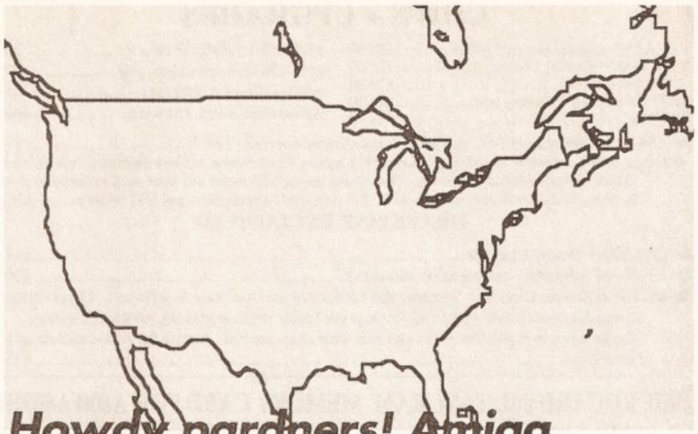
All this news of future Amigas and enhancements has helped to confirm the impression that the Amiga will be the main contender for the position of most popular/most multi-talented computer for a long while yet. The graphical enhancements (24-bit display, 32-bit blitter) will make the Amiga's position in the graphics industry a lot more secure.

WHAT ELSE IS ON THE WAY?

The Pasadena Show also played host to a press conference where Jim Dionne, Commodore US's President, referred to the probability of new Amigas in the pipeline with built-in CD-ROM drives.

Although details are inevitably scant, it would seem to make sense given trends towards CD-based games.

It's also known that Commodore US is prototyping machines based on the Motorola 68060 chip (the 68050 got bypassed) for its high-end range.



Howdy pardners! Amiga Cowboy Bob Liddil rounds up all the latest stories from the other side of the Atlantic

Eeeehaw! Here's your Amiga Cowboy, USA, back again for another report on the American Amiga Scene. And has it been a happy month? Well, yes and no.

HARD TIMES FOR A4000

The Amiga 4000, flagship of Commodore America's new Multimedia line is already in trouble. A memo is being widely circulated among US dealers that says: "Due to an unfortunate mishap at the factory, all the A4000s shipped by Commodore prior to 10/14/92 have a serious problem with hard drive performance. Somehow Commodore has formatted the drives using the Old File System, which barely works with the A4000's IDE controller. Fortunately, there is an easy fix..." The memo then goes on to offer a software-originated fix that involves reformatting the drive.

CHS Inc of Champaign, Ill are the originator of the memo. They are the Commodore equipment liaison for the powerful MicroPace company which is a key force in US Amiga and Amiga aftermarket wholesale products. Since the problem is now known, it seems unlikely that it will reoccur when the A4000 hits the European scene. But still, things happen in American Amigadom that are strange to say the least.

NICE FOR MICE

Just when we thought we'd heard everything where new products are concerned, along comes *Star Trek – the Mouse Pad* to upset the chuck wagon. MousTrak of Carson City, Nevada, have announced two new *Star Trek* mouse pads licensed by Paramount pictures featuring images from that popular American TV series of the sixties and its present day sequel. A large pad (11 by 11 inches) showcases a brightly coloured USS Enterprise in space near an exploding planet with moons and galaxies in the background. A smaller, more standard-sized pad (8 by 8 inches), offers the Enterprise 1701D *(Next Generation)* ship against a nebula and galactic background of gorgeous colours. Just the thing for the Amiga owner who has everything. They retail for US $16.95 and require about $4.00 per pad in postage to get them across the Atlantic.

Probably the best way to pay for one is with Visa or Mastercard, who will do the currency conversion automatically. The mouse pads are not on sale as yet in the UK or Europe, but can be had from MousTrak of New England, PO Box 66, Peterborough, NH 03458 USA, sales agents for the manufacturer.

Incidentally, also available is *Indiana Jones and the Last Crusade* (the mouse pad) and NASA's *Parade of the Planets* mouse pad. I wonder if *Dr Who* or *Blake's Seven* are in the works? Or perhaps *Fawlty Towers – the Mouse Pad*, with a nice photo of John Cleese on. Hmmm.

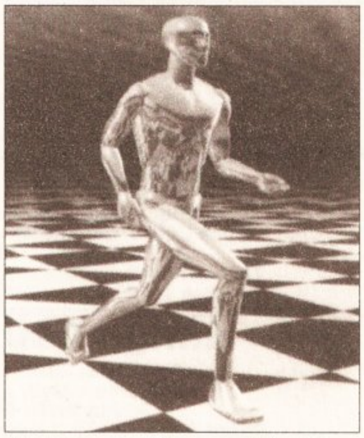
ARTIST'S MODEL

One of my all-time favourite things to do with the Amiga is drawing things. Since I have the artistic talent of a sea anemone with crayolas, I am very grateful when a program comes along that makes me look good. Believe me... *Cycleman* makes me look good.

Cycleman is a unique model of a human-like figure, and a perfect complement for the 3D program *Imagine*. With it, Amiga users can now easily afford the power to generate computer animations of the human form. The program is also inexpensive compared to other modelling programs.

Cycleman is the ideal companion for *Imagine* because it offers beginners a perfect tool for experimentation and learning, while at the same time allowing them to immediately begin creating human simulations with great ease. Yet it is also flexible enough to satisfy advanced users interested in building more sophisticated animation and images with the human form.

The software comes with a completely built 3D model of a human-like figure, ready to use. It works only with *Imagine*, so there can be no confusion about translating different object formats. The figure comes with its own built-in motion ready to use. A very life-like 'Walk' or 'Run' action for the 3D model can be loaded straight off the disk (apparently, other natural functions like draw a six-gun or rope a bronco must come with time and additional effort). At any rate, users can have the figure walking or running through their animation without spending hours trying to design these basic movements. The attributes and modelling of the figure can be adjusted as with any *Imagine* object, so users have complete control over the appearance of the figure. Users can build their own poses and motion for the figure, since all the limbs of the figure are separate objects, grouped in a special hierarchy.



Cycleman provides you with a 3D human figure, all ready to animate

The software is accompanied by a detailed manual with instructions for building motion with the figure, and changing its appearance, as well as other *Imagine* tips.

Owners of the software may use renderings and animation of the figure in commercial productions without seeking permission from the vendor. That's very handy when one considers what a hassle licensing arrangements always seem to be.

The retail price for *Cycleman* is US $59.95. For more info contact T Wilson, PO Box 4691, Crestline, CA 92325 USA ☎ 714 338 1786.

DOING TIME

From our 'people and places' department comes a tale of Amiga use both unique and intriguing. Tory Esbensen, who is a vendor of educational software and an avid Amiga enthusiast residing in the USA's frozen North, has informed your Amiga Cowboy that his favourite computer (the Amiga) is being employed by one of America's oldest prisons. Herein lies a tale of both desperation and hope, all wrapped into one.

Minnesota's Stillwater Correctional Facility was built in 1914 and is currently home to more than thirteen hundred extremely dangerous criminals. Those of us who take literacy for granted may not be able to comprehend that a very high percentage of prisoners have very low or non-existent reading abilities. The inmates of Stillwater are no exception.

Ironically, this institution is the home of *The Prison Mirror*, America's oldest continuously operating inmate newspaper. But not many men incarcerated there could read the words on its pages.

Into this bleak and desperate place (which in the past has housed the James Gang and Bob and Cole Younger, among other old West outlaws), has come my friend Tory, and his software company Micro-Ed Inc, with the purpose of teaching inmates to read.

It is a fact that literacy programs flourish when presented through the medium of computers. Tory, whom I know to be a tireless campaigner in this field, is especially complimentary of the performance of the Amiga in this role.

So, while Minnesota winters beat mercilessly against unyielding prison walls, hard men are improving their lot in life by learning to read, a skill that will serve them well upon their release. To that end, the Amiga and Micro-Ed are right there in the forefront. It's just another way that the Amiga improves the quality of life in the States.

Incidentally, Micro-Ed has many fine programs, some of which we will be discussing in the future in this column. Or, if you just can't wait, you can contact Tory Esbensen at Micro-Ed Inc. PO Box 24750, Edina, Minnesota, 55424. Tell him your Amiga Cowboy sent ya.

By the way, if you're feeling particularly venturesome, ask him how you might obtain a sample of *The Prison Mirror*.

Well, it's time for me to climb back into the saddle and mosey on down the trail. So, until next month, this is your Amiga Cowboy saying, "Whoopie-ty-yi-yea and so long, pardner from the USA!" AS

Talking Shop

Welcome to the Amiga world's liveliest letters pages! – the place where you get the chance to speak your mind. So join your host, the editor, Andy Storer for some more no-holds barred bantering. And remember, all you have to do to be included is send your missive to: 'Talking Shop', *Amiga Shopper*, 30, Monmouth St, Bath BA1 2BW. So get to it!...

A SPLIT RANGE?

It is just me or are Commodore painting themselves into a corner? The A600, 1500 and 2000 are 16-bit with only 4096 colours from ECS while the A1200 and 4000 are true 32-bit with the AGA chips supplying a palette of 16.7 million. The A3000(T) is stuck somewhere in the middle.

The 3000 will probably be scrapped – and the 2000 and 1500 with it – to leave an enormous space to be filled with an AGA machine with higher expansion potential than the 1200 but not as powerful as the 4000.

The 600 has only just been released and I wouldn't put it past Commodore to scrap it and replace it with another totally new machine. They've done it twice before. But I think it's more likely that pretty soon dealers are going to find that they are being shipped A600s with Workbench 3, AGA chip sets and 68020 processors. And I haven't mentioned high density drives yet.

If Commodore don't change the A600, then in the future will we only be able to buy 'serious' software for AGA? And will games only be written for ECS?

The reason I bought my Amiga was because of the flexibility to work so close to the cutting edge of computer technology. I hope that'll still be possible.

Gulliver Handley
London

I can't see Commodore scrapping or overhauling the A600 in the way you suggest any more than I can see software houses only writing games for the 600 and serious software for the 1200. What we have are two entirely different Amigas, yes, but I expect developers to cater for both.

A GREAT A1200

I recently had a letter printed in your magazine proclaiming that the PCs would squeeze out the serious side of Amiga computing, and the Super Nintendo would eat huge chunks out of the games market. I do still agree with this still but I feel that things are changing.

PCs seem to now have hit their rock bottom price and I feel that they are now making the wrong moves but I'm still very worried about the console threat.

But the A1200 is great. It has the right price, the right look, and certainly the right graphics. And believe me, Commodore have done all these things perfectly, all but for one slight problem. That of the 68020 chip that runs the show.

You see the Falcon has the one thing that nobody else has got, a 68030 processor, and you'd be stupid to say that lots of buyers aren't going to see that simple difference and save up the extra hundred quid.

I just hope that people notice the A1200's superior graphic modes and data handling.

I think the A1200 will shift units simply because the legend Amiga is written on it and there are a lot of people (like me) who that means a lot to.

All I have to do now is buy one myself, and you have to tell everyone to do the same.

David Walker
Norwich

And that's exactly what I'm saying: Buy One – it's a great machine. I shouldn't worry about the Falcon though – its shipping date's been put off yet again and I still don't see any great swathes of software announced for it.

As for consoles – well just remember this handy little tip: 'An Amiga's for Life – not just for Christmas!'



The A1200: is it really the dream machine we've all been waiting for?

SCUPPERED SCSI

I can imagine cries of Wow!, Amazing!, Brill!, I MUST have one NOW! are echoing across the land with the announcement of the new Amiga 1200, and with products such as *Wordworth2, Pagestream 3* and *Prodraw3* now on the market the old Amiga seems to be finally coming of age, which is great news.

But I imagine there are an equal number of cries of "What!, you can't be serious!", coming from the mouths of current Amiga owners.

The reason? – again, no SCSI support, that's what! There must be a considerable number of serious Amiga users out there who now have £350+ of redundant hardware.

If they want to get into 32-bit Amiga computing, which I'm sure they desperately will, what are they to do except cuss and swear and generally want to murder anyone from Commodore?

HEEEEEELLLLLLLP!

Roy Davies
Herefordshire

But SCSI support is on the way – there'll be a SCSI-II adaptor out in the New Year.

QUESTIONS, QUESTIONS

After seeing the arrival of the A1200 and A4000, I have a few comments to make.

1) Does the fact that the A1200 is priced at only a £100 higher than the A600, and comes with a 68020 processor and a brand new 16 million colour chipset, mean that sales of the A600 will drop considerably?

2) Why didn't CBM keep the side expansion bus, as well as putting in a PCMCIA slot? They could have put them side by side. This surely would have been a good move as users would have access to all existing peripherals as well as the brand new cards.

3) What has happened to the 1.7Mb disk drives that we were promised eons ago. My current internal drive cannot write to disks without corrupting them. I do not want to replace it with a naff 880K one though. Come on Commodore, produce the drives or licence the technology as you are holding the Amiga back in this area.

4) Why has the SCSI controller been dropped in favour of IDE? Surely Commodore should have put in an SCSI-II controller in its top end machines and an IDE device in the bottom end.

5) Does the A1200 feature a TV modulator?

6) Does it have a trapdoor slot as in the A500/A500+/A600?

7) Can the A1200 take a PC VGA monitor as standard, instead of those crap CGA efforts?

8) Can the processor be unplugged and a new 68030 or 68040 be plugged in?

9) Why has the sound not been enhanced? Even eight channels would have been better.

Although I have moaned a bit through this letter, I do think Commodore have now got on the right track. As long as they can continue to come up with innovations such as CDTVs, 16 million colours and a better WIMP system than any other I shall continue to buy Commodore.

A S Cuddwell
South Yorkshire

OK are you ready? Here are my best efforts on your posers:

1) Yeah, I expect to see it at £199 in a year's time.

2) Good question. I can't see any reason why they both couldn't have been included.

3) The A4000 has 1.7Mb drives and they're due at some point for the A1200 – meanwhile KCS are developing an external version – see the news pages.

4) The IDE adaptor was cheaper and allowed CBM to bring in the A1200 at less than £400.

5) Yes it does.

6) Ditto.

7) Ditto again.

8) In theory, yes.

9) According to Commodore enhancing the sound would have pushed the price over the magical

£399 mark.

Hope those do the trick!

THE A1200 IS DEAD

So Commodore have surprised everybody and released the A1200. Despite your enthusiasm I remain totally unconvinced. We all knew that the amazing AGA chip set would be used in all future Amigas.

Apart from this it doesn't appear that Commodore have listened to users' requirements at all. So where is the 16-bit sound, and DSP, and MIDI ports, and high density floppy, and SCSI port?

OK, so £400 is pretty cheap but history dictates that Amiga owners are willing to pay that bit extra for quality.

With multimedia emerging, graphics and sound are becoming more integrated so Commodore must be mad to ignore the sound capabilities of their new range. I suppose 16-bit A/D and D/A converters may eventually be offered on PCMCIA cards but that is totally missing the point as the majority of software will never support it.

Will the A1200 take centre stage as the Amiga of the 90s like the A500 dominated the 80s or will it disappear in six months when Commodore introduce 16-bit sound into the range?

This is not the new generation of revolutionary Amigas that we expected. This is a half-hearted and desperate attempt to answer the threat from consoles, PCs and Atari. With Christmas approaching Commodore have come up with a prize turkey.

A Spanner
Cheshire

I think you're being extremely over the top there Mr Spanner. 16-bit sound will be offered on memory cards, as you say, and I believe new software will, as always, come to support it.

I'm afraid though that the dream machine you're after just isn't possible at a price of £399. It's as simple as that, unfortunately.

YEP IT'S A BOO-BOO

I was glad to see your review of the new Amiga 1200 in your latest issue of Amiga Shopper. It has proved to be very useful and I will probably be purchasing one of these machines within the next year.

However I have spotted one slight problem with your HEAD TO HEAD A1200 versus Falcon article on page 11.

According to this comparison the new A1200 has a processing speed of 14Hz as opposed to 14MHz. This makes the A1200 look about as quick as a 20 year-old calculator with flat batteries!!

I am sure this is not really the case and am sure is was an accidental mistake and understand fully how easy it must be to make a small one letter mistake in a 178 page magazine.

Jason P Duignan
West Lothian

Er...yes Jason, it was a typo. Unfortunately in amongst the 100,000 or so other words of the last issue it's probably not the only one that escaped us!

BUT NOT THIS ONE?

Your review of accelerators is incomplete, as it fails to mention the RCS Fusion 40. It has a 28 MHz 68040, and can carry up to 32 MByte of RAM. Put it in an A1500, as I have, and the result is better than an A4000 in speed and price terms.

Chris Blackmore
Somerset

We had to leave out a few other accelerators too for various reasons – like them not turning up on time, for instance. This happened to my current favourite, the 68030 Derringer board from CSA for $150!

SCRAP THOSE DISKS

Magazines must stop putting out coverdisks containing fully working programs even though everyone is happy to get the 'free' software, and it increases your circulation.

Why? Because it is killing the software houses just as effectively, if not more so, than any amount of piracy.

To explain, I recently bought an 'ST' to do some conversion work and was about to buy the £70 *Timeworks* for it. Shortly afterwards it appears on a coverdisk, in full, for 'free'.

Fine, I bought the mag and saved lots of money. The point is though, that someone could have been about to release a new DTP program to the market, after a lot of development work. I'm happy, but would they be? Will they bother now? I wouldn't. To attempt to compete against the 'free' product would be financial suicide.

And on the subject of cover disks what happened to the results of your reader surveys? Didn't they show that people wanted you not to have a disk, and to keep the cover price down? Don't turn into *Amiga Format* – we already have one, thanks.

J Tullin
Tyne and Wear

Don't worry for one moment on the last score Sir. As for the debate over full versions of serious software – well surely it's just up to commercial developers to produce better versions than the ones that appear on coverdisks? You could just as easily say, otherwise, that high-quality PD was ruining commercial software – but then maybe you are.

CHECK THE ADS!

Your *Amiga Shopper* is really good and I enjoy reading it. Now for a few questions.

1. I've been searching for an Amiga 500 or Amiga 600 for the last couple of weeks now, but I've had no success.

2. If you know where to get one please send me the address or the phone number so I can get one. Thank you.

Mark Whitaker
Lancashire

Well, we do get all sorts of letters don't we readers? This man's got problems. I imagine any of the adverts gracing these pages will deliver the goods but am I missing something? Is it really that easy?



Anyone got some cunning circuitry to add one of these to an Amiga?

GENIUS NEEDED

I read your articles in the November edition, comparing the Amiga with a PC and a games console, together with the contributor's forum with great interest.

There is no doubt that Amiga will never break into business or eduction in any significant way and its once strong area of DTV is now being attacked by PCs.

It is clear that the games producers are looking for a more secure medium and so will concentrate on consoles. The TV programme *Gamesmaster* rarely features anything else now.

Should we desert the machine in favour of a cheap PC with expensive software or look longingly at what is available for other equipment as ours slips further behind?

Let's face it, games are important, so how can we ensure a continued future for these? Would it be possible for a cartridge adaptor to enable an Amiga to become a Megadrive? If so, we could justify a machine for the children or other games players which is second to none and still have a real computer for so-called serious use. With a CD-ROM drive we would have everything!

I suppose an *Amiga Shopper* DIY project would be out of the question! I hope something can be done and the sooner the better.

BD Grayson
West Yorkshire

So there you have it – a delightfully succinct though perhaps overly-optimistic solution to the perils of platform independence. In other words – anyone got a smart box of electronics that'll enable an Amiga to boot up Megadrive games?

Now there's a project that you could send into the usual address – DIY Projects, Amiga Shopper, 30 Monmouth St, Bath BA1 2BW – and grab yourself £70 – though something more like £70,000 would probably be nearer to the mark.

Which brings us neatly to the next letter which, I should add, was received after we'd only run one of our ongoing series of do-it yourself Amiga hardware projects...

GASH-BOX?

Since the letter from Anthony Croxford in the October edition of *Amiga Shopper* we have been waiting in anticipation for the DIY hardware projects.

The first project "A ROM OF ONE'S OWN" was frankly, pathetic. How you could justify two full pages (and seven diagrams of the same piggy back chip) on something which should have taken half a page, is beyond me. One picture and a schematic would have been sufficient.

To prove a point, some of my eleven year olds completed this "project" from bits in my "Gash Box" (I'm sorry?!? -Ed).

If you want to aim your magazine at children, try advertising games. If you want to stay serious give us some projects we can get our teeth into.

The Rev Bob Bailey
West Sussex

My initial response on reading your elitist, arrogant and ungracious letter, Bob, was to bin it.

But then I thought it *was* worth comment after all. So I'd just like to say to the more enlightened and Christian souls among you that if you've managed to build a decent DIY project through your own honest labour then why not pass it onto those less fortunate brethren of yours who, through no fault of their own, are not as well versed in the intricacies of electronics as you are.

You could even pass on the £70 fee to charity if you so wish.

Somehow I think you won't, Bob.

NATURALLY ITS KCS

The Amiga 600 Power PC Board Console £169.99

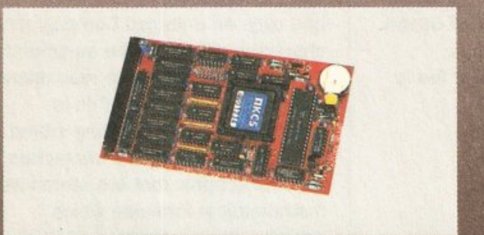


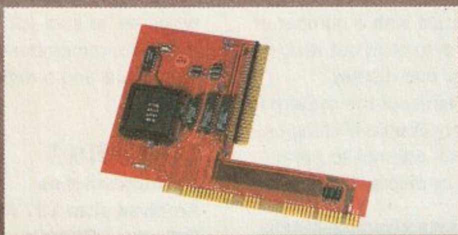
KCS WAS THE FIRST WITH A PC EMULATOR FOR THE AMIGA 500. KCS IS THE FIRST AGAIN FOR THE A600

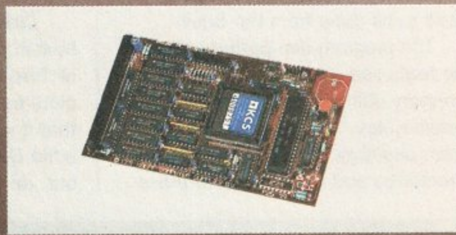
MAKE YOUR AMIGA IBM Compatible

The PC Board gives up to a maximum 1 MB memory plus hardware clock.

All versions of the PC Board come with Ver 4.5 software which includes SOUNDBLASTER/ADLIB emulation.





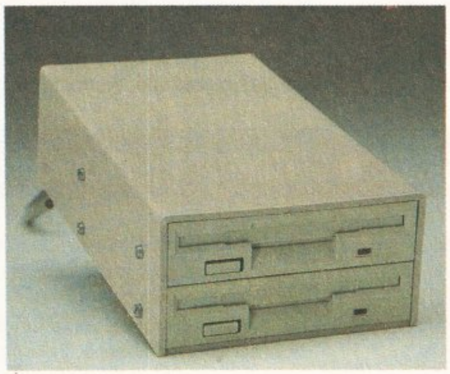


Amiga 500 version .... £149.99 Amiga 1500/2000/300 adapter.............. £74.95 Amiga 500 Plus version.............. £149.99

(DOS Extra - Enquire for current price) Due to currency fluctuations all prices subject to change without notice

KCS DUAL HD-DRIVE

(available shortly)



In Amiga mode:

(no PC Board necessary)
Suitable for all AMIGA models: 500/500P/600/1200/1500/2000/3000/4000.
Capacity: 880 KB/1,76 MB/appr. 2MB 4MB by means of realtime compression.
Read and Write in High Density mode runs two times faster than a standard Diskdrive.
Compatible with the software of Synchro Express, Cyclone and Blitz.
Highspeed copy in appr. 35 seconds in Low as well as High Density format.
KCS Backup program for Harddisk-Backup of Amiga as well as PC partition (up to 4MB on 1 disk).
Hardware NO CLICK.
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THE AMIGA SHOPPER SHAREWARE

Welcome to Volume I of the Amiga Shopper Shareware Collection. On the disk you'll find the latest versions of some of the most popular public domain and shareware programs around. You'll also find some special programs you're very unlikely to have seen anywhere else before. Enjoy!

This is where we help you to get the most out of your cover disk. It's chock full of useful utilities for your delectation – so let's get it up and running right away

DIRWORK 1.62

All Workbenches
Archived size: 81845
Full size: 187719

DirWork is a fully-featured directory utility by Chris Hames. Its goal in life is to make your life simpler, by enabling you to use the mouse point and click interface to carry out many of those operations that normally need to be done from the Shell.

The program can perform all of the feats you would expect of a directory utility: copy, delete and rename files, move swiftly up and down directory trees, create directories and so forth. All of these operations are carried out with a simple click of the mouse.

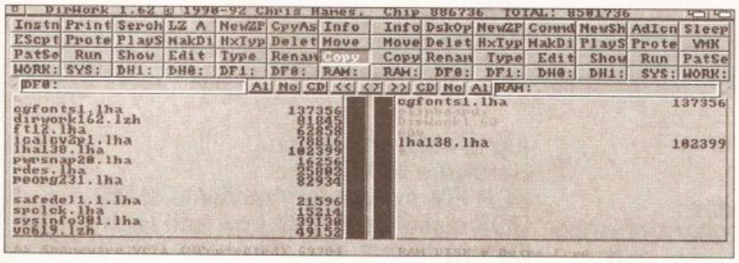
The program is run from the Shell by typing 'DW'. It must either be in the current directory or specified within the AmigaDOS path. One of its advantages is that after you've typed its name, the program dissociates itself from the launching Shell, so you can still use the Shell for further work.

But what really makes *DirWork* a bit more special than its brethren is its configurability. Along with the main program comes a special editor which will enable you to modify *DirWork* according to your tastes and needs. It's run by typing 'DWEdit' at the Shell prompt. Not only can you decide which screen mode, colours, window size and position, but you can also change the functions of the available buttons.

DirWork comes with a number of built-in programs to print out text, de-archive lzh files, and display pictures. The beauty of the system is that if you simply double clicking on a file *DirWork* will attempt to print out, de-archive or display it according to its type. These functions all run as separate processes on their own screens, so you can switch between them and *DirWork* itself and carry out further operations.

You're not stuck with the built-in programs, however. If you have a better text editor/displayer, picture viewer or whatever, you can use *DWEdit* to instruct *DirWork* to use that instead.

DirWork is an excellent program which we're sure you will find useful. If you do, remember that it is shareware and a registration fee is required.



With *DirWork* you can cut out all that frightening and clumsy business of messing about with the Shell

CGFONTS 1

All Workbenches
Archived size: 137356
Full size: 201202

This is a collection of fonts for use in desktop publishing programs, video titling, or use as screen fonts via Workbench 2's *Fountain* program.

Five individual fonts are included in the archive: Architect, BlackChancery, Faustus, Luxembourg and Mira. They were originally released as freely distributable Adobe PostScript format fonts, and then converted to Compugraphic format by Darren Ewaniuk with the *Font Manager* program supplied with version 3 of *Professional Page.*

Compugraphic fonts are useable by a variety of desktop publishing programs as well as Workbench 2. They are far better than screen fonts because they are resolution independant. If you enlarge a character from a screen font you will see that it becomes extremely blocky and ugly. An enlarged Compugraphic character will always be as smooth as is possible given the resolution of your screen or printer. This is because, rather than being stored as collections of dots, the characters in a Compugraphic font are stored as mathematical formulae which describe their outlines.

If you intend to use the fonts with Workbench 2, then you must first run the *Fountain* program supplied with your system disks. This will install the fonts and prepare the Amiga to use them. What actually happens is that you select the sizes of the fonts that you are interested in, and *Fountain* creates screen fonts at the required sizes at the maximum resolution possible. Instructions for

GETTING AT THE PROGRAMS ● GETTING AT THE PROGRAMS ● GETTING AT THE PROGRAMS ● GETTING AT THE PROGRAMS ● G

The eager ones among you will have already ripped the disk from its cover and banged it straight into your machine... and realised that it's not a bootable disk. Basically, we decided it would be better to fit far more on the disk by archiving everything. This of course means that each program is that bit harder to get at. So here's how you do it.

On the disk you'll find the following directories and files:

- c
  - echo
  - lha
- s
  - startup-sequence
- cgfonts1.lha
- dirwork162.lzh
- ft12.lha
- icalcv2p1.lha
- lha138.lha
- pwrsnap20.lha
- rdes.lha
- reorg231.lha
- safedel1.1.lha
- spclck.lha
- sysinfo301.lha
- vc619.lzh

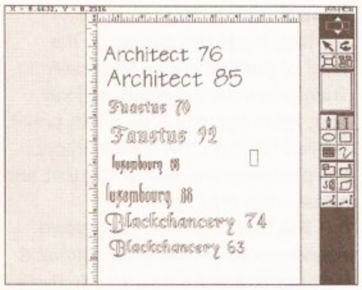
The startup-sequence file is a small script to print up a message informing the more impatient of you that you need to boot from Workbench. For this the 'echo' command in the c directory is needed.

The other command in the c directory is 'lha', which is an archiving utility. It's a damned useful one, so useful that it appears twice on the same disk. We've included the working program in the c directory just to ensure you can get at the other programs, but the full package is also included as an archive. That way you can have full access to the documentation and a chance to register if you decide to keep the program.

So, the first thing you must do is boot-up with Workbench. Either boot from floppy or boot from your hard disk as normal. Now, you need somewhere to put all those lovely programs. If you're using a reasonably large hard disk, then you should have no problem. If you're working on a floppy system, you'll need a number of blank, formatted floppies standing by.

In the main text you'll find a figure giving the overall size of each

COLLECTION VOLUME ONE



There's a selection of scaleable fonts to brighten up your text

using *Fountain* can be found in Appendix D of the *Using The System Software* manual.

One common problem with *Fountain* is that the program will not run because it requires a later version of the fonts library than is supplied on the Workbench disk. For reasons best known to Commodore, the version needed is actually on the Fonts disk supplied with your machine. The best thing to do is copy this from the libs directory of the Fonts disk to the libs directory of the Workbench disk. Afterwards, *Fountain* will run as planned.

You'll find instructions for using the fonts with a desktop publishing package in the package's manual.

The fonts in this archive are all mildly esoteric, and as such are probably more useful for video work.

You willalso find that some of them don't include certain characters – mainly non-essentials sucg as abstruse punctuation marks, braces and the like. For dull details of which characters are supported, check the archive's documentation.

ICALC 2.1

All Workbenches
Archived size: 78816
Full size: 177296

Martin Scott's program is one for all you scientifically orientated types out there. It's a fully-featured calculator that can handle complex numbers.

What, you may well be asking, is a complex number? It's a combination of an ordinary number and an imaginary one. Before you ask, an imaginary number is a mathematical concept designed to get around the problem of finding the square roots of negative numbers

As you know, the square root of a number is another number which, when multiplied by itself, will yield the original number. Ordinarily, there is no number that can be multiplied by itself to give the result of -1, so mathematicians invented one and called it 'i'. Using 'i', the square root of any negative number can be found. For example, the square root of -4 is 2i.

You might think that imaginary numbers are of no use to anyone, but you'd be wrong. Despite the fact they are figments of someone's slightly strange imagination, they are of great use in engineering work, particularly when dealing with alternating current in electronics. They're also essential to the now famous Mandelbrot set.

Of course, you don't need to use imaginary numbers with the calculator. It's more than happy to deal with the ordinary numbers that we all know and love.

Icalc is run from the Shell by typing 'Icalc'. It works on a prompt basis, with you, the user, typing in expressions for evaluation. Expressions should be entered as they normally are for a computer. For instance, unlike conventional algebraic notation, two variables to be multiplied must be separated by a '*' thus: 'a*b'. To write it as 'ab' would confuse the program since it would assume this was another variable. The exception is when using imaginary numbers, where '4i' is taken to represent '4*i'.

Like all good calculators, *Icalc* will enable you to assign results to variables for use later on. The first character of a variable name must be a letter, and the name must not conflict with one of *Icalc*'s pre-defined symbols such as 'PI' or 'sin'. A value is assigned to a variable by putting it on the left-hand side of an expression and following it with an equals sign; for example: 'fred=sqr(5)' will assign the value 25 to fred. A variable's value is used in an expression simply by using the

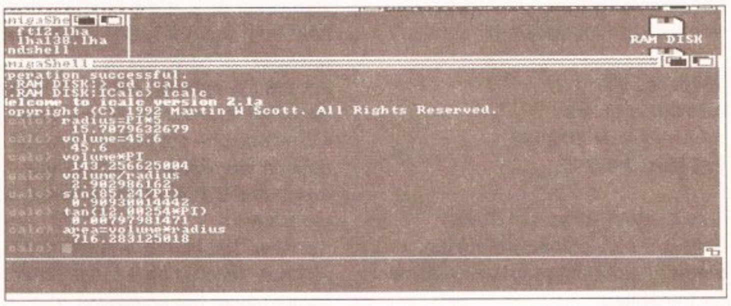
STOP!

Before going any further, it's very important that you make a back-up of your cover disk. First move the write-protect tab on the disk so that the hole is open – this means that no information can be written to the disk. Next, open a Shell window (you may choose to use a directory utility instead, but bear in mind that it must know about the 'lha' program if you want it to de-archive anything).

Now type the following:

```
diskcopy from df0: to ↵
df0:
```

You will be asked to insert the 'source' disk – this is the cover disk. After you do so, the Amiga will read some of the information from it. Then you'll be asked to insert the 'destination' disk. This is the disk you want to become your copy. Insert this disk, and the information will be written to it. You'll then be asked to replace the 'source' disk. The process will repeat a couple of times before the entire disk has been copied.



***ICalc* is a sophisticated scientific calculator. It will handle everything from simple arithmetic to imaginary numbers and trigonometry**

HE PROGRAMS ● GETTING AT THE PROGRAMS ● GETTING AT THE PROGRAMS ● GETTING AT THE PROGRAMS ● GETTING AT THE

group of files after being de-archived alongside a description of each individual program.

Change directory to the root of the cover disk using the command:

```
cd as_shareware_voli:
```

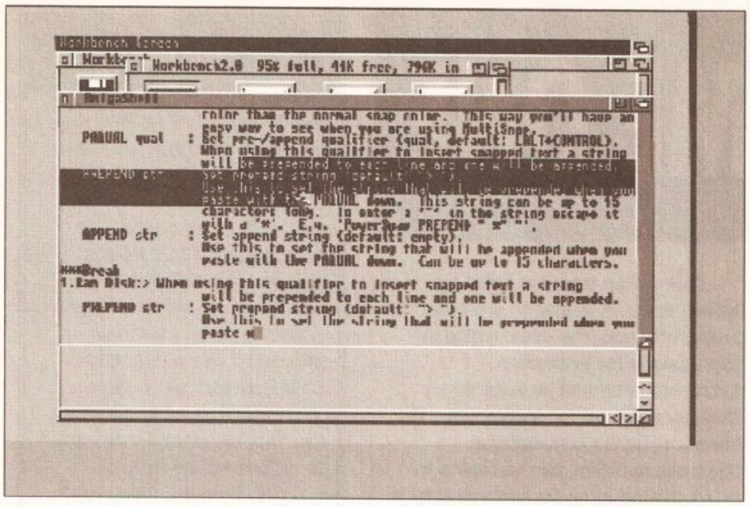
The next thing is to run the archiving program itself. Pick a program that you're interested in. Let's say it's *Virus Checker*. To get that on to another disk, you need to type the following command:

```
c/lha -x -r -a x vc619.lzh ↵
Other_disk:
```

After the various options (detailed in the lha document file) comes the name of the source archive. Obviously this varies depending on the program you're interested in. The final word on the line is the destination of the de-archived files. If you're using a hard disk you might want to make it the 'c:' directory. If you're using floppies make sure that you give the name of the floppy disk itself rather than the name of the drive (df0: or whatever) as this will avoid confusion when any necessary disk swapping occurs. Needless to say, owners of more than one floppy drive can place their source disks in another drive and avoid all the hassle of disk swaps.

Some of the archives create a whole sub-system of directories when de-archived, so it might be an idea to de-archive into a temporary place first so you can see exactly how things lie before copying the files over to where you want them within your own directory structure. This is particularly true of programs you want to live in your c: directory. You won't be able to access them as commands from the Shell unless their paths are directly known to AmigaDOS, which is to say that they don't exist as part of a sub-directory within c:, but rather as programs directly visible within c: by use of the 'dir' command.

Well, that's just about that. Inside each archive you'll find full instructions for making use of the programs. These, along with the instructions printed on the next five pages, should ensure you get the very best from the Amiga Shopper Shareware Collection Volume I. We hope you find it useful.



Now you can copy text from any area of the screen to any other area, with no more hassle than a couple of mouse clicks and key presses

variable's name. The expression 'fred*6' would give the answer 150.

Many built-in functions are supplied with *Icalc*. One example is the square function, written as 'sqr()' and shown in the example above. A complete set of trigonometric functions is also supplied. See the documentation for a full list.

The power of *Icalc* comes from its ability to use user-defined functions. Like imaginary numbers, it's not necessary to understand this aspect of the program to use it. But the facility is there if you require it. *Icalc* comes with a powerful C-like language in which you can define any functions which you use regularly. See the documentation for details.

LHA 1.38

All Workbenches
Archived size: 102399
Full size: 240262

This is latest version of Stefan Boberg's *LhA*, probably the most powerful archiving program available for the Amiga.

An archive is a convenient means of collecting several files together into one large file. This makes it easier to send groups of files via modem or copy them to disk. The big advantage of an archive, though, is that it compresses the information. An archive is in general much smaller than the sum of its parts. Once it is de-archived, all of the files are returned to their normal state without any loss of information.

There are several archiving programs for the Amiga, and many more for machines such as the IBM PC and Apple Mac. *LhA* is compatible with the *LhArcA*, *LZ* and *LhArc* programs for the Amiga. Furthermore, it is compatible with both *LHA* and *LhArc* for the IBM PC, which makes file transfers between the Amiga and PC that much easier.

Of course, you'll have already made use of *LhA* to get at the various programs held in archives on your cover disk. It's a program that runs from the Shell, and it can take a number of parameters. The first set are the options, each one being specified by a dash followed by an alphabatic character. The possible options are explained fully in the documentation file that comes with the program.

After that comes a command, which is denoted by a single letter. For instance, the command 'x' instructs the program to extract files from an archive, while 'a' instructs it to join a group of files together into an archive.

After the options and command comes the name of the archive. This name may also include a path if the archive isn't in the current directory. The archive name is followed by the directory to which the files should be extracted, or the directory from which the files will be gathered to create an archive.

It's also possible to supply a further command line argument, a wildcard specifier which will restrict the files read from or entered into the archive according to their names.

LhA is shareware; we encourage you to support the author if you intend to continue using it.

POWERSNAP 2

Workbench 2.04
Archived size: 16256
Full size: 34047

PowerSnap is a tool developed by Nico François, author of *PowerPacker*. It enables you to use the mouse to select areas of text anywhere on the screen and paste copies of it elsewhere – in a Shell window or string gadget, for example. This is a damned useful thing to be able to do, and a facility that the Mac has had for years.

Before using *PowerSnap*, it must be installed in your system. Probably the best place to put *PowerSnap* itself and its icon file PowerSnap.info is in the c: directory of your system disk. A further file, powersnap-handler, must also be present. The program will work if this is in the current directory, but it is a better idea to put it in the L: directory of your system disk for long-term usage. If you don't want to bother copying the files across via the Shell, you can run the automatic installation script provided as part of the archive.

If you find *PowerSnap* useful you might want to include it as part of your startup-sequence. To do so, put the following line before the 'endcli >nil:' line in the startup-sequence:

```
PowerSnap
```

An even easier option is to drag the *PowerSnap* icon and drop it into the WbStartup drawer.

To copy a segment of text into *PowerSnap*'s buffer ready for pasting, move the pointer to the start of the text you're interested in. Then press the left-hand [Alt] key and, while keeping it pressed, press the left-hand mouse button. Move the pointer to the end of the text and release the [Alt] key.

The text is pasted back down elsewhere by pressing the left-hand [Alt] key and the V key. Alternatively you can use the [Alt] key and the right-hand mouse button.

PowerSnap will work with all non-proportional screen fonts, so long as their width doesn't exceed 24 pixels. When selecting text, always start with a visible character, as *PowerSnap* has difficulty if the first character it sees is a space. Further instructions are included in the program's documentation.

RDES 1.1

All Workbenches
Archived size: 25802
Full size: 75293

James Bond, Napoleon Solo, George Smiley, Kim Philby – where would they have been without a code machine? Now you can join their dubious ranks with the aid of RMA Luckock's *RDES* encryption program.

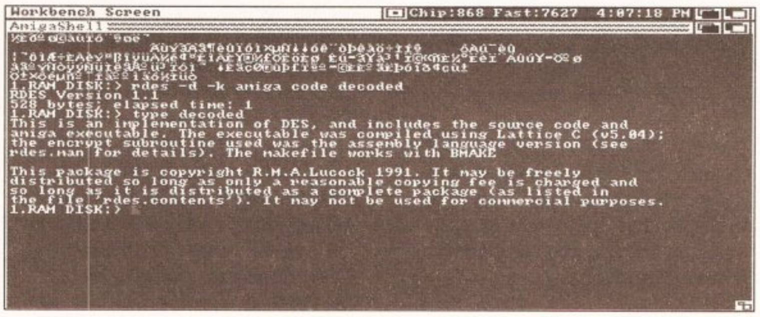
RDES will take any text file and turn it into what looks like completely meaningless garbage. Of course, it also has the ability to reverse the process and turn said garbage back into the original text file. It does so using the infamous DES algorithm, an encryption algorithm so powerful that it has been the subject of USA government export restrictions.

If this were all there was to it, then *RDES* wouldn't be much cop. Anyone with a copy of the program could decode anyone else's messages. The thing that prevents this is a 'key' – a string of up to

"Napoleon Solo, George Smiley, Kim Philby – where would they have been without a code machine?"



Lha 1.38 **is one of the best archivers you'll find for the Amiga. It's so useful, we've used it to compile this cover disk**



Keep you secrets safe with *RDES*, an encryption program that makes the Nazi's Enigma machine look like something the Boy Scouts might use

eight characters in length that helps to uniquely encrypt the file. Only when supplied with this original key will *RDES* be able to make sense of an encrypted document.

RDES is run from the Shell, and supports a number of options, each being represented as a letter preceded by a dash. The three important ones are: '-e', which instructs *RDES* to encrypt a file; '-d' , which instructs *RDES* to decrypt a file; and '-k' which, when followed by a space and up to eight characters, specifies the key string to be used in the encryption/decryption process.

The two final arguments that appear on the command line are the names (and possibly paths) of the input and output files. If either or both of these are missing then *RDES* will input/output text directly to/from the console.

REORG 1.1 AND 2.31

All Workbenches
Archived size: 82934
Full size: 181124

ReOrg, by Holger Kruse, is a program whose function is to re-organise the layout of data on your floppy and hard disks, the idea being that this will improve the speed of file and directory accesses.

Files are saved on to disks as a series of blocks. As a disk becomes full, there may not be room to put a new file on it as a single contiguous chunk. To get around this, AmigaDOS will split the file into several smaller chunks and save these wherever it can find space on the disk. This is known as disk fragmentation. The problem is that accessing such files is slow, since AmigaDOS has to search across the disk several times to recover each of the file segments. *ReOrg* takes each file from the disk, collects it together, and saves it back as a single contiguous block. A very similar process is performed for directories.

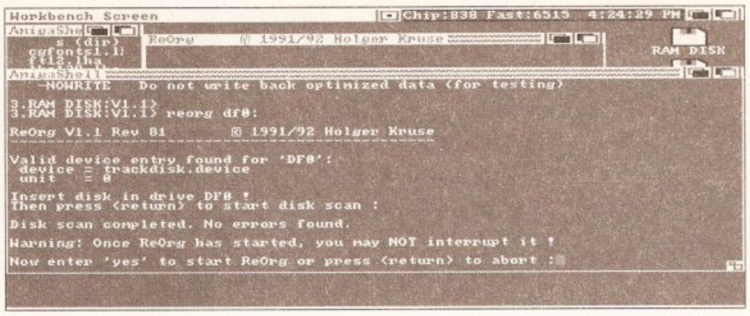
Before you immediately begin optimising your disks, bear in mind that doing so is always a risky process. It's a very good idea to back up first any disks you intend to optimise, and to check that afterwards all the files are still intact.

Two versions of the program are included in the archive. Version 1.1 is for Workbench 1.2 and 1.3 users, while version 2.1 is for Workbench 2 users. See the documentation files for details of their differences.

You must use the Shell to run *ReOrg*. Simply type its name and press [Return]. A variety of options of interest to the advanced user can be specified on the command line – check the documentation for details.

Optimisation takes place in two stages. The first is while *ReOrg* is scanning the disk. During this stage *ReOrg* may be halted with a press of the [Ctrl]-C keys. You must confirm you wish to proceed before the second stage is begun. Once it has, any attempt to stop *ReOrg* while it works in its single disk mode will corrupt the disk. *ReOrg* may also be used with two disks – taking the contents of one, optimising them and storing them on to the other. While it works, *ReOrg* displays some status information including how long the process will take.

ReOrg is a shareware program. Please support the author if you find it useful.



Improve the efficiency of your hard and floppy disks with *ReOrg*. A word of warning, though – always make a back up first

SAFE DELETE 1.1

Workbench 2.04 and above
Archived size: 21596
Full size: 42802

Well, the use of this program by Chris Watson should be fairly obvious. Just about everybody has deleted files by mistake. Perhaps you make a mistake with a filename, perhaps you do a wildcard delete on your hard disk when you meant to do it on a floppy – whatever the cause, the result is always the same: you've lost something that you wanted to keep.

Safe Delete operates in a way similar to Workbench's Trashcan. It alters the AmigaDOS delete program such that any files subsequently deleted, rather than being removed from the disk altogther, are instead relocated in a special 'trashcan' directory (not to be confused, though, with Workbench's own Trashcan drawer). This trashcan is specified with an environment variable called 'TRASH', set using the AmigaDOS SetEnv command. The trashcan can be anywhere, even on a different volume from the one containing the files to be deleted, and can, if you require, have its position specified relative to the files in question.

Now, whenever you've deleted a file by mistake you can copy it back from the trashcan to where it should be. This is all very well, but there are no doubt some files which you will want to remove forever. If nothing else, you are going to need to clean out the trashcan every now and again.

Safe Delete provides for this by means of a 'temporaries list'. Any files whose names are included in the temporaries list will be completely removed when deleted. Wildcards can be used to specify groups of files, and directories can also be specified. An obvious element of the temporaries list is the trashcan directory, enabling it to be flushed when it becomes too full. Items can be added to the temporaries list by entering them as tool types in *Safe Delete*'s Info window. The temporaries list may also be described from the Shell. See the program's documentation for details.

No other programs are required to make *Safe Delete* run. It's best to place it in the WBStartup drawer or the User-Startup file so that it is run every time your machine is booted. The program is shareware, so send the author £5 if you keep using it.

SPCLOCK 2.1

All Workbenches
Archived size: 15214
Full size: 35875

Mark Waggoner's *SPClock* uses sprites to display a digital clock on the screen.

Why use sprites? They're largely independent of the screen on which they are displayed, just like the Workbench pointer, and so if you're using a large, scrolling display, the clock will stay exactly where you put it while the rest of the display moves. It's much easier than having to go searching around for an ordinary clock window. The other advantage is that the clock will also be displayed on any further screens that are opened.

It can be run by clicking on its icon, or by typing the following:

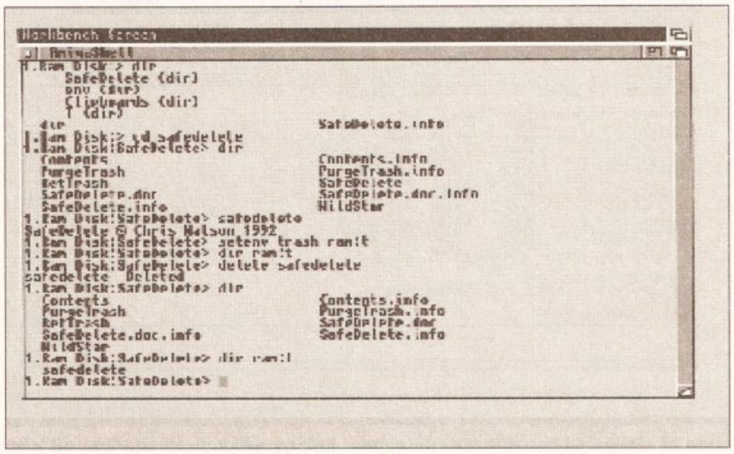
```
run >nil: SPClock <nil:
```

A variety of options are available. They can be set either as tool types

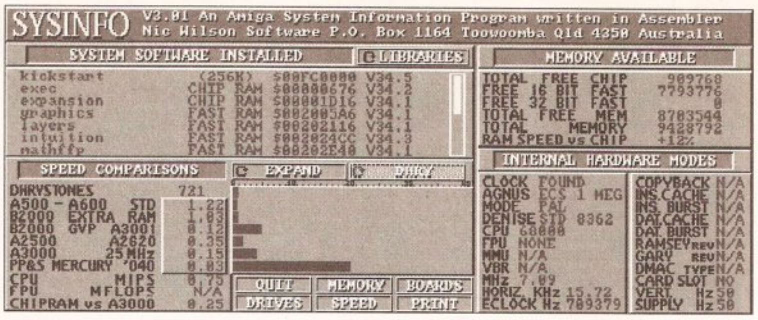
THE SHAREWARE CONCEPT

There is a distinction between those programs labelled as public domain and those labelled as shareware. Public domain programs can be distributed and used as often as you like, without any restrictions.

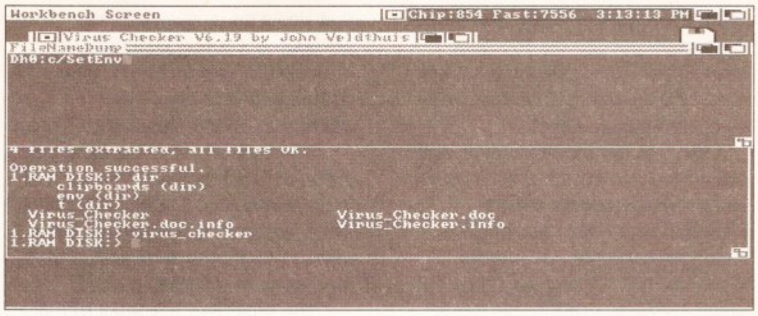
The shareware concept is a little more involved. Shareware programs are distributed almost as adverts. The idea is that if you like the program and find it useful, you should 'register'. This involves sending your name and address and some money (the amount varies – sometimes it's left to your discretion, at other times the program's author specifies how much in the documentation) to the author. Doing so guarantees that you'll receive the latest updates of the program. You may also receive a better version of the program, since some freely distributed shareware versions are restricted in some way. You'll also help ensure that people continue to produce such excellent quality shareware for the Amiga, which can only be a good thing.



If you're one of those people who are a little too hasty with the delete command, then you'll love *SafeDelete* – delete in haste without repentance!



SysInfo **tells you everything you always wanted to know about your Amiga but didn't know who to ask**



Keep your system pure with *Virus Checker*. It sits in an unobtrusive window and keeps an ever-vigilant eye on memory and foreign disks

using Workbench's Info menu, or as options on the Shell command line when the program is run. You may choose the screen coordinates at which the clock appears, choose its colours, whether or not it displays in 24 hour mode, and whether or not the colon separating the hours from the minutes blinks. See the documentation for more details.

SYSINFO 3.170

All Workbenches
Archived size: 39130
Full size: 86261

This is the very latest version of Nic Wilson's famous *SysInfo* program. It's a utility which provides a wealth of information about your Amiga set-up and enables you to draw comparisons with various other kinds of Amigas.

Run the program by typing:

```
run SysInfo
```

or double clicking on its icon from the Workbench. *Sysinfo* works on its own custom screen, but it is possible to get it to send its output elsewhere – to a printer or file, for example. To do this, use the option '-p' when running the program from the Shell, followed by the standard AmigaDOS redirection symbol. For example:

```
run SysInfo >prt: -p
```

will send its output to your printer. Once the program is running, using it is a simple matter of clicking on gadgets to obtain whatever information about your system it is that you require.

As well as giving a basic figure representing the speed of your Amiga, *SysInfo* will also test the speed of your disk drives and give information about any hardware you have connected.

SysInfo as a shareware product, and a damned useful one at that, and as such its author deserves the financial support that he asks for.

FLYING TOASTERS

Workbench 2.04
Archived size: 62858
Full size: 170743

The peculiarly named *Flying Toasters* is actually screen blanker written by Gernot Reisinger.

The idea behind screen blankers is that they will produce a constantly changing pattern on your screen when the computer is not in use, thus preventing a still image from burning itself permanently into your monitor or TV screen. *Flying Toasters* does this by generating animated, er, flying toasters.

Once mouse and keyboard activity has stopped, *Flying Toasters* waits for a user-specified time (the default is three minutes) before swinging into operation. It's as simple as that. One area of the screen (the default is the top right hand corner) is defined such that if the mouse pointer is placed there *Flying Toasters* will appear immediately. All this, and much more, is configurable from the program's tool types gadget, accessed by clicking on its icon and selecting Info from the Workbench menu.

You can run *Flying Toasters* by typing 'FT' from the Shell.

VIRUS CHECKER 6.19

All Workbenches
Archived size: 49152
Full size: 102054

Virus Checker is acknowledged to be one of, if not the, best anti-virus programs around.

This latest version of John Veldthuis' program will detect all known viruses at this point in time. It also has the facility to learn about new ones.

The program is simplicity itself to use. Just type:

```
Virus_Checker
```

or double click on its icon from the Workbench. It's not a bad idea to put the program into your startup-sequence to prevent infection on a day-to-day basis. If you're running Workbench 1.3, just place the above line in your startup-sequence before the 'endCLI' line (*Virus Checker* must be in the c: directory or the root directory of your boot disk). Workbench 2 users have it easy: they can just drag the icon into their WBStartup drawer.

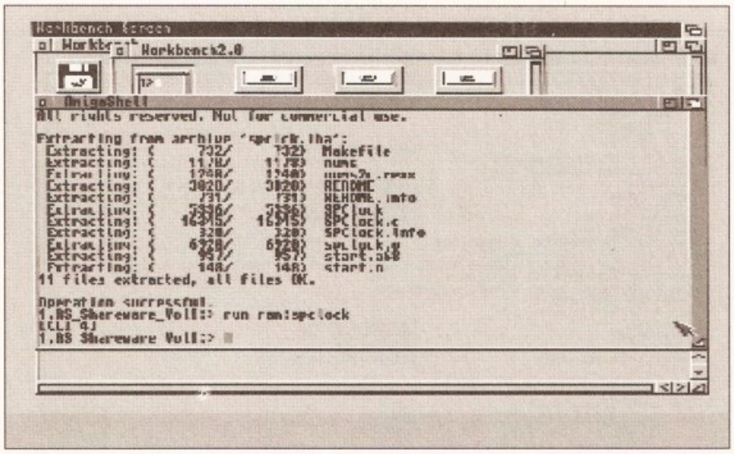
Virus Checker is constantly on the look out for viruses. Any new disks you insert will have their boot blocks checked. In addition, you can check your memory and go through every single file on a disk to test for more sophisticated viruses. There's also a special option for checking for damage caused by the Saddam virus, a particularly nasty one. These operations are initiated by the program's menu options.

You'll find a list of all the virus types that *Virus Checker* recognises within the its documentation file. AS

IF THINGS DON'T WORK OUT

Life isn't perfect. It may well be that you've encountered a problem in using your cover disk. If you have, here's what to do:

- If there wasn't a disk attached to your copy of the mag – see your newsagent
- There is a disk but it's corrupt – send it, along with an SAE, not to us but to Discopy Labs, Unit 2+3, Amiga, Technology Centre, Drayton Fields, Drayton NN11 FR1.

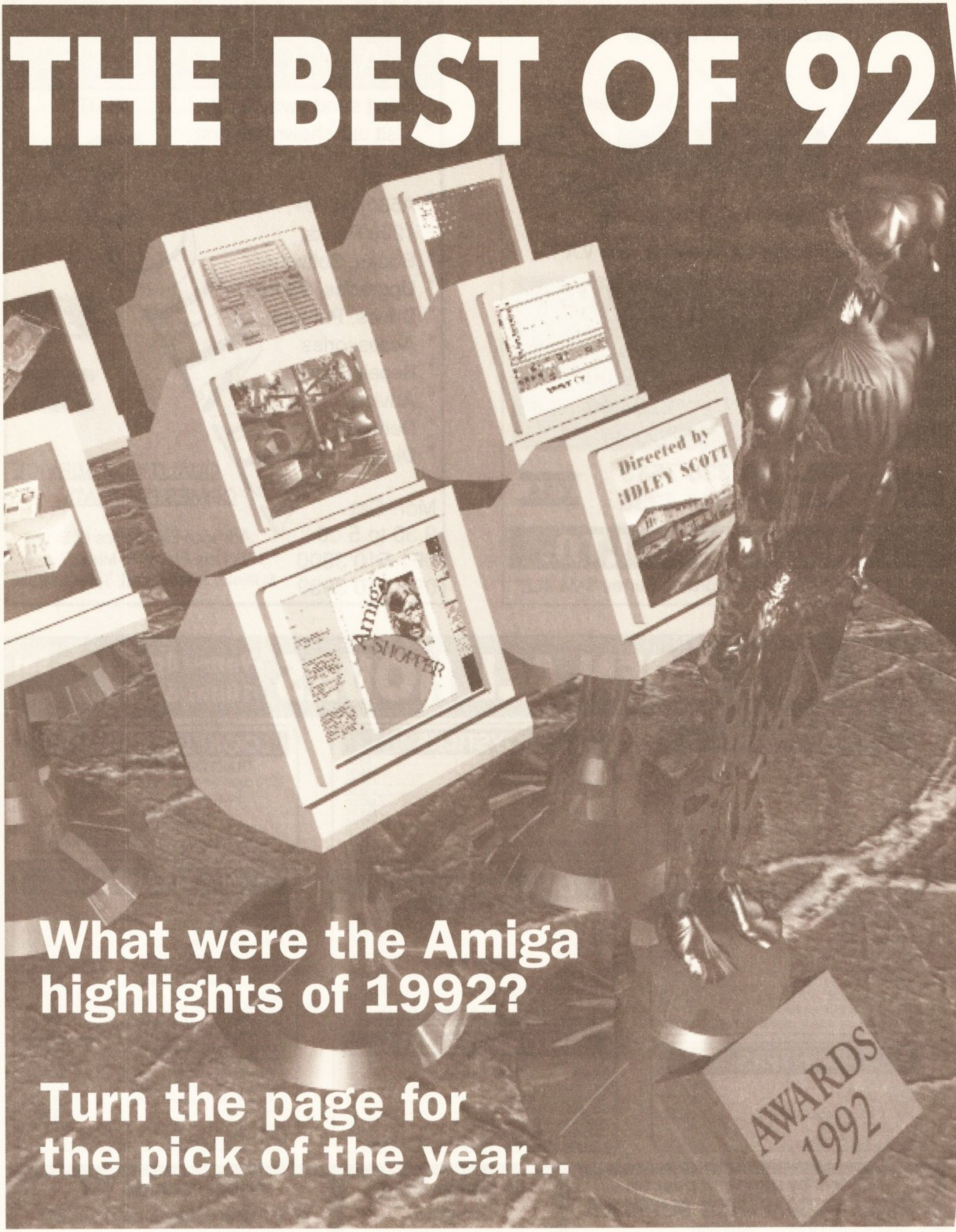


Tired of clocks whose displays disappear behind windows or are lost on large scrolling screens? Then try *SPClock* – it's as constant as time itself



Save your screen from phosphor burn-out and amuse your friends with the *Flying Toasters*. screen blanker

THE BEST OF 92



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VIDEO AWARDS

Even with Mac and PC video markets gaining ground, 1992 was a good year for Amiga video products. Display and manipulation devices were the name of the game, with products like GVP's Impact Vision 24, Archos' AVideo24, Digital Creation's DCTV, Progressive Peripherals' Video Blender, Opal Technology's OpalVision and, of course NewTek's Video Toaster, all keeping Amiga video on the move. We also saw the arrival of the RocKey – the first "budget" chroma key unit from RocTec, as well as a clutch of new and exciting digitisers and a low-cost autocue package.

And there was a lot of excited chatter about other hardware, much of which has yet to see the full light of day: the video modules for OpalVision, GVP's ADDI and EGS systems, Progressive Peripheral's Rambrant card, a PAL Video Toaster (that old chestnut) and DMI's EditMaster system.

But the most significant Amiga video development this year has to be the advent of the new graphics display modes provided by the AA (or AGA as it seems to be known in the USA) chip set which is fitted to the new Amiga 1200 and 4000 models to provide outstanding picture quality with up to 262,144 on-screen colours in the new HAM8 mode as well as a 256 colour mode. Imagine the potential for animation and desk top video applications! Promises of complete 24-bit capability have also been made for a future revision of the chip set, so there is now real hope for the future of the Amiga as a graphics machine if Commodore can sell it properly.

DISPLAY DEVICES

Although the OpalVision card is available now, its much-vaunted video modules have yet to appear. But IF the pre-publicity proves correct then the PAL Amiga video world is in for a rather pleasant suprise – framegrabber, genlock, vision mixer, digital video effects, chroma keying and de-interlacing all available via a series of plug-in modules.

On the specifications alone I'd give them an award, but they're not here yet, so we'll just have to wait and see. What OpalVision *does* offer video users even before the modules are available is the ability to superimpose Amiga graphics directly over 24-bit images in a mix which can be output to (and indeed mixed with) video by using a standard RGB genlock. And of course it is possible to create wonderful looking 24-bit graphics with the OpalPaint software.

We shouldn't forget those other stalwart display devices, DCTV and AVideo 24, both of which have their good and bad points.

DCTV broke the mould when it demonstrated just what it could do with pictures and animations: several million colours moving at once is certainly something to behold, plus a great paint program and a good digitiser built in to the deal.

All of which was let down by a composite video output which wasn't all it should have been and the fact that it wasn't possible to genlock its output with video.



***Scala MM200* may cost £464 but its graphics, sound, titling, presentation and multimedia features represent great value for money**

AVideo 24 broke something too – a price barrier. For less than £400 it was possible to have quality 24-bit output direct to an Amiga RGB monitor and for under £600 all-in buy a top-class 24-bit paint program as well. With its Amiga graphics overlay and animation capabilities AVideo 24 brought quality at a sensible price. The payoff in this case was that installing the hardware required some fiddling with the innards of the Amiga, TVPaint 1.7 (for AVideo) didn't work in real-time 24-bit and required a 68030 processor and loads of memory into the bargain.

But the real advantage of the AVideo 24 (and DCTV as well, for that matter) was that it brought the chance for Amiga 500 owners to join the big league of 24-bit graphics users without the need for Zorro or video slots.

GENLOCKS

This will be brief. For my money there were no genlock developments of earth-shattering import this year: it was a case of more of the same really. Prices changed, a few new models arrived, but no great shakes overall.

So no awards for genlocks, not because every genlock produced in 1992 was rubbish but simply that there was nothing particularly outstanding.

DIGITISERS

Undoubtedly the best fast-scan digitiser I saw in 1992 was Macro System's VLab card for Amiga 1500/2000/3000 computers.

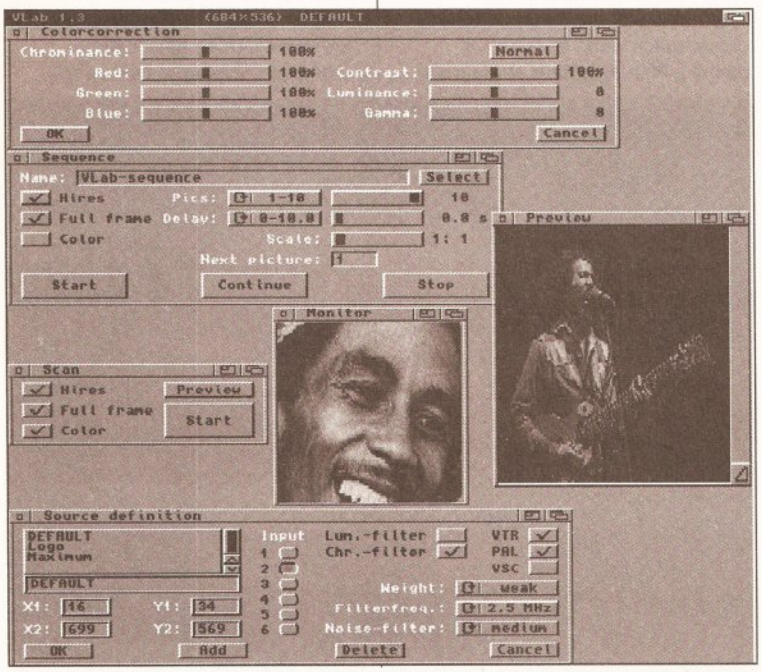
Because it uses an on-board framestore it is capable of making extremely fast grabs of very high quality. The only drawback is that it needs to be mounted in a Zorro slot of a WB2 equipped Amiga, effectively ruling out Amiga 500, 600 and 1200 owners – though the good news is that an external version is allegedly in the pipeline.

Of the slow-scan digitisers two were outstanding. The first was Rombo's Vidi-Amiga 12, breaking new ground as a sub-£100 unit with built-in colour splitter, S-VHS input and very quick grabbing at remarkably good quality – for a non-framestore unit.

The second, which would have won but for the late arrival of the Rombo was the German DigiTiger 2, produced by Klaus D. Tute. Again fast and of very high quality, the Rombo now outpaces it in both features and cost. Honourable mention goes to DCTV's built-in digitiser.

CHROMA KEY

Whilst the RocKey certainly wasn't the first Amiga chroma keyer, it made sure that it was the cheapest. And even though its quality isn't up to that of professional video



Macro Systems' VLAb fast scan digitiser in action. Using an onboard frame store, it currently needs to be mounted in the Zorro slot of a WB2- based Amiga. An external version is on its way though for A500/600/1200 owners

standards by a long chalk, the RocKey should give faithful service in most domestic video circumstances. There is one caveat – the RocKey has to be connected to a genlock in order to work. But this also has advantages, because the combination of genlocking and chroma keying gives a far wider choice of effects than simple chroma keying alone could.

TITLING

1992 definitely wasn't a boom year for new titling and presentation software, at least not in terms of numbers. Both SCALA and ZVP offered much-improved versions of their *Scala* and *VideoStudio* programs and that was about it. Neither of these products was aimed at the budget Amiga video user, with *SCALA MM200* costing £464 and *VideoStudio 3* pitching in at £149.

Nevertheless, *SCALA MM200* (the MM stands for MultiMedia, reflecting the fact that *MM200* can control external hardware as well as Amiga-produced graphics and sounds) is an excellent upgrading of the highly-regarded *SCALA 1.1* and it deserves an award for ease of use alone, never mind all the brilliant, easy-to-use features which it contains. If presentation is your game *SCALA* should probably be the name, though not necessarily *SCALA MM200*, as *SCALA* is still also available in less-featured, but markedly less expensive versions for home titling and video studio use. *SCALA MM200* gets my titling/ presentation/ multimedia software award for 1992

VARIOUS

While the big boys have been busy shifting hardware ZEN Computer Services have been beavering away in Manchester, coming up with solutions to some of the more obscure needs of video producers.

As well as producing the invaluable *AntiA* font aliasing program (which has just been revised), and several other useful programs including a cue clock, they also market an autocue device called SmoothTalker.

With this an Amiga can be used to display the script of a TV programme to the presenter, who can then read it to camera. Autocueing (or prompting) is a simple enough idea, common in television and conferences, but generally rather expensive. SmoothTalker brings autocueing to any Amiga at a reasonable price (at least compared to the competition).

So that's it. Doubtless there are omissions, and there will certainly be disagreements, but there you go. Who said awards were fair?

Gary Whiteley



GRAPHICS AWARDS

1992 was definitely a good year for Amiga graphics. It was first and foremost a 24-bit year, no doubt about it, with display cards arriving (or being promised) thick and fast, at ever decreasing prices, and 24-bit software getting better and better into the bargain.

IN TRUE COLOURS

The graphics highlight of the year had to be Opal Technology's OpalVision modular 24-bit video and graphics system, which wowed all the reviewers who saw it – and this when only the basic motherboard was available.

For both cost and quality OpalVision – with its brilliant OpalPaint software – is going to take some beating, and when the video modules hit the streets it's likely to become the hottest video/graphics product on the block.

But there were other 24-bit boards which looked like they would have the edge until OpalVision overtook them in the final furlong. Archos' AVideo 24, along with an incredible deal on TecSoft's TVPaint 1.7, broke the price barriers to make 24-bit accessible to many more eager punters.

Progressive Peripheral's Rambrant card turned a lot of heads with its exciting specification, as did GVP's EGS card, but at the time of writing neither of them were available, making them non-runners for this years awards.

MORPHACIOUS

It was also a morphing year with both GVP and ASDG following the lead of Black Belt's *Imagemaster* and releasing their own *CineMorph* and *MorphPlus* products.

Morphing, which was used to such good effect in Terminator 2 and is now being overkilled in bland TV advertising, provides a way of making a smooth transition between two images by way of a mixture of fading and stretching techniques.

Used correctly, its effects can be breathtaking. Not very long ago morphing was strictly for the big boys. Now, like many other high-tech fads, it's available to the rest of us.

OLD FAITHFUL

But what about lesser mortals who are content to use a few colours less than 24-bit? *Deluxe Paint 4* has kept its lead in the "normal" paint program stakes, though personally I dislike some of the changes that were made between *DP3* and *DP4*, and there are ups as well as downs with this particular darling of the graphics masses.

Nevertheless, there's no doubting that it is still a great paint and animation package and I'll be keen to see what Electronic Arts are going to come up with for the new AA chip set Amigas – especially in the face of what appears will be stiff competition from Digital Creation's forthcoming *Brilliance* software.

FONTASTIC

1992 was a happy year for font fans, who were able to lay their hands on a wide range of new styles courtesy of a wide selection of PD Adobe Type 1 fonts being converted to the Compugraphic format.

These can be converted to either bitmap or Bullet formats with the WB2 Fountain utility and voila! – loads of new fonts for graphics and presentation work. Definitely a bargain. Plus Agfa have made many of their original Compugraphic fonts available in Bullet format so they can be used directly with any WB2.0 equipped Amiga. Amiga graphic wordsmiths have never had it so good.

CLOSE MATCH

Image manipulators have also been well catered for, as ASDG's *Art Department Professional* continued to evolve and provide a tried and tested solution to image compositing, processing and manipulation.

Black Belt's *ImageMaster* (yes, the same program that offers morphing) is the other contender for this particular crown, but there are sufficient differences between the two to pronounce a well-deserved draw.

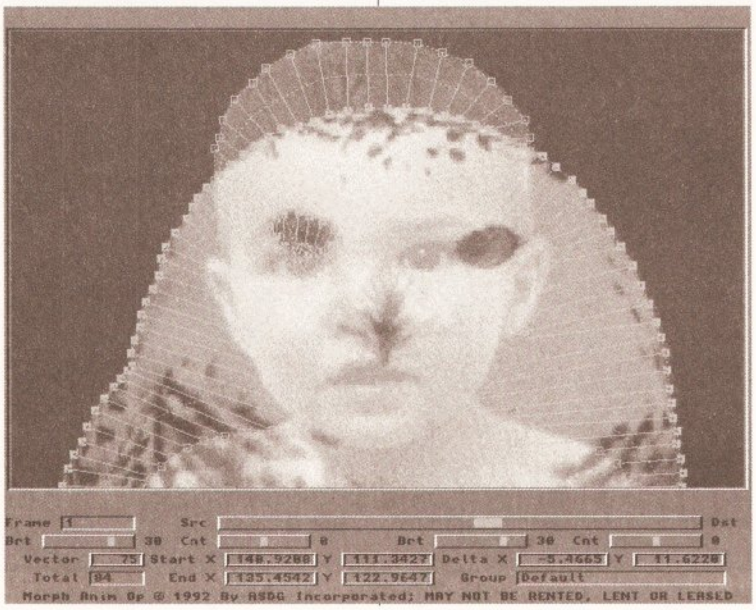
Art Department Professional wins in some ways, *Imagemaster* in others. Serious graphics professionals should probably have both, though if I were forced to choose just one it would be a very tough decision.

THE THIRD DIMENSION

Adding another dimension both Impulse's *Imagine 2* and Activa's *Real 3D* have stayed ahead in the 3D modelling and animation markets.

Of the competition *Caligari*, though popular in the US, doesn't seem to find the same favour over here and *Lightwave* – excellent though it is – remains dongled by NewTek's NTSC-only Video Toaster, a fact which hasn't stopped dedicated users rendering with it and then using *AD Pro* to convert each frame to PAL screen sizes.

Not content with the ability to wrap our 3D masterpieces with images created in paint programs (of any variety) there have been a significant number of texture kits



Morphing proved to be the most popular advance in graphics during 1992 — programs like *Cinemorph* and *MorphPlus* pushing the Amiga even further



For top-notch 3D graphics the best application has to be *Imagine 2* from Impulse– although Activa's *Real 3D* comes pretty close too

released to provide instant gratification to the scannerless, digitiserless or simply artless, not to mention those who can't program algorithmic textures (and that's probably most of us).

Alternative Image's *Textures* provide plenty of variety for those needing to add natural-looking surface wraps to their 3D work, whilst Apex Software's *Essence* program offers an incredibly wide range of algorithmic textures designed to be used with Impulse's *Imagine* or *Turbo Silver 3* programs.

SWAP SHOP

Again, referring back to 2D things, both Syndesis' ageing *Interchange* software (which is shortly to be replaced by a brand new version – *Interchange 2*) and Axiom's *Pixel 3D 2* have both given much-needed assistance to those who need to convert 2D images such as company logos into 3D objects or change an object from one particular format to another – except of course for *Real 3D* users who have to use *Race Trace* or convert *Sculpt4D* format objects internally. *Pixel 3D 2* is an extremely useful program which should be in the tool kit of every at least half-serious 3D animator.

So far we've not heard of much that is home-grown, but Alternative Image's *Reverser* utility has proved to be indispensable when renaming batches of images from one particular application to another.

Although this might seem like anorak territory, spare a thought for the poor soul who has to rename a whole load of *Deluxe Paint* images (with the tag .00xx stuck on the end) to *Real3D* format, for instance (which are postfixed .xx only).

Doing it by hand can be a nightmare, which you'll readily understand if you've tried it, but until *Reverser* appeared on the scene it was really the only way.

My 'Best-spent-tenner-of-the-year' award.

THE CRUSHER

Aaargh, how could I forget JPEG? My work room is overrun with disks as it is, but without JPEG I'd be in a much worse position. Although the idea has been around for a while, the Amiga implementations of this excellent image compression routine really started coming thick and fast this year. Both Black Belt and ASDG claimed to be the first to offer JPEG in commercial software, but who cares? Anyway, it's all over the place now, and there's even a PD version knocking about. Paint programs such as *OpalPaint* and TecSoft's *TV Paint* offer JPEG compression and decompression on the fly, as do both *Art Department Professional 2* and *Imagemaster*. Typical savings of 60% or more can be made by compressing IFF images into JPEG files which have to be decompressed again for use. If the compression ratio is carefully controlled there is little or no apparent loss in picture quality. Thanks to the JPEG research group for this little gem.

So there you have it. Before I run out of space I'd better name the graphics awards for 1992.

Gary Whiteley

GRAPHICS AWARDS

Best 24-Bit Graphics card: OpalVision

Best Regular Paint Program: Deluxe Paint 4.1

Best Utilities: Reverser,Fountain

Best 3D Program: Imagine 2

Best 3D Utility: Pixel 3D 2

Best Image Processor: Tie between Art Department Professional 2 and ImageMaster.



Best Ideas: JPEG compression, PD CGFonts.



This year has seen great steps forward in Amiga desktop publishing. Gold Disk and Soft-Logik released major upgrades to *Professional Page* and *PageStream*; a third company joined the game, Saxon Industries with *Saxon Publisher* and the *SaxonScript Professional PostScript interpreter*.

Hand scanners went through a revolution. At the start of 1992 what was available was expensive and results were mediocre. But now there are at least three hand scanners that can produce high quality results in 16 real greys, the software is improving all the time, and we've got inexpensive colour hand scanners on the horizon.

For the professional there was the launch of the 24-bit Epson GT-6000 flatbed scanner, and the scanning software from ASDG, makers of *Art Department Professional*, which program itself has had major improvements made to it.

With the release of the Amiga 1200 and 4000, which feature faster processors and the new AA chipset, we look forward to 1993 with anticipation. Will on-screen 256-colour desktop publishing become a reality on the Amiga? Will it be stable enough and work fast enough to be productively usable? I, for one, can't wait to find out.

TOP PAGE MAKE-UP PROGRAM: *PROFESSIONAL PAGE 3*

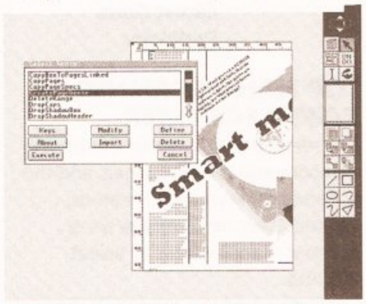
With the addition of support for Adobe Type 1 typefaces, with the increases in operational speed and screen refresh, and with the innovative Page and Formatting genies, *Professional Page 3* surely stands head and shoulders above rival Amiga desktop publishers with respect to what it can do and how well it does it.

Professional Page demands hefty system requirements – lots of memory (2Mb min), a hard drive and ARexx to start with – but even the semi-professional desktop publisher needs to get the job done as quickly as possible, and working with 1Mb of memory and floppy disks simply isn't practical.

The *Professional Page* system adheres to the traditional DTP way of working. First you drag out a box on the page, then you fill it with either some text or a graphic. This box can be resized, rotated, and dragged around to any position on (or off) the page. You have total control over your page. Many page layouts can be automated to a large degree by using previously saved templates or the new Page Genie system, but ultimately every single mark on the page is your responsibility.

This is the essence of page design – total freedom, no holds barred.

There's no doubt that using *Professional Page* for producing the odd fancy letter or leaflet would be like cracking a nut with a sledgehammer. But if you want to produce high quality publications on a regular basis, from business cards through leaflets to magazines, and considering the *ProPage/ProDraw* bundle is now being sold for well under £200, it's difficult to see why anyone would choose anything else.



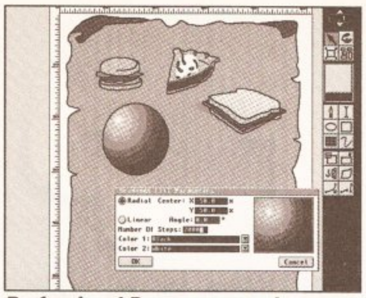
***Professional Page's* Genies can turn long, complicated jobs into a simple click of the mouse**

Also rans:

PageStream, Saxon Publisher.

TOP STRUCTURED DRAWING PROGRAM: *PROFESSIONAL DRAW 3*

What puts *Professional Draw* at the top of this tree is its 'hotlink' to *Professional Page*. With both programs running you can send structured art from *Professional Page* to *Professional Draw*, edit or process it, and then send it back to *Professional Page*.



***Professional Draw* can now do proper radial and liner gradient fills**

Because *Professional Draw* looks and operates almost exactly the same as *Professional Page*, using this 'hotlink' between them is almost transparent – it's like using two parts of one program. But *Professional Draw* can stand on its own two feet, it doesn't require *Professional Page*.

While it's natural to think of a drawing program as something you use to create graphics to be imported into a page make-up program, *Professional Draw* is very able to produce professional page output in its own right. In this respect it can be thought of as a single-page DTP program, perfect for leaflets for example.

But combine *Professional Page* and *Professional Draw* – at a cost of under £200 – and you have a desktop publishing system that is very difficult to beat on other platforms, let alone on the Amiga.

Also rans:

Expert Draw,
ProVector

TOP HAND SCANNER: *POWER SCANNNER*

The release of the Power Computing monochrome hand scanner, and the subsequent reviews it received, caused every other Amiga hand scanner manufacturer to sweat buckets.

Nothing on the market at the time came close to the quality of the scans produced with the Power Scanner, especially the clarity of its greyscale scans.

The unique Power Scanner hardware plugs into the parallel port and comes with a throughport so that if you have a printer you can have both peripherals connected to the Amiga at the same time.

The software, *PowerScan*, is straightforward to use. First you set the size of the scan, then you scan your image, then you save your image.

Between the second and third steps you can manipulate and process the image. Various drawing tools, albeit fairly rudimentary ones, allow you to touch up the picture or add bits to it; you can rotate and rescale the image; if it's a scan of a coloured illustration or photograph, then you can convert the black-and-white dithered image to a real 16 levels of grey image.

Hand scanners can be frustratingly awkward to use at times, particularly if what you want to scan is wider than the 4in scanning head, but the Power Scanner provides an inexpensive and quick way to get images from paper on to disk, and from there into a desktop publishing program.

Also rans:

AlfaScan Plus
DaataScan.

TOP TYPEFACES: *COMPUTER SAFARI FONTS*

Commercial typefaces are normally expensive, often prohibitively so for the home desktop publisher. Which is why the Computer Safari range of typefaces, and its UK distributor, E M Computergraphic, gets this award – because the Computer Safari typefaces are professionally designed and finished, but not professionally priced.

There are 24 disks available, each containing between three and five typefaces. Most of the typefaces fall into the 'decorative' and 'cursive' categories – characters in the shape of planks, flowers and the like, and characters that look like handwritten text.

But there are also some useful serif and sans serif faces that could be used for body copy, and a few that might make good headliners.

They are available in Adobe Type 1 or Compugraphic format.

Also ran:

300 Adobe Type 1 Fonts (PD-Soft).

TOP PROFESSIONAL DTP AID: *EPSON GT-6000 SCANNER*

The beauty of the Epson GT-6000 flatbed scanner is its reasonable price (comparatively speaking), the fact that no extra hardware is needed, so it will work with all Amigas, not just those that have slots for cards, and the excellence of the scanning software.

Being an *Art Department Professional* 'load module' the scanning software merges seamlessly into that program, so you can scan directly into *ADPro* and see the image on screen afterwards.

Or, if you don't own *ADPro* or don't have enough memory to store all the 24-bit data, the scanning software can be used standalone to scan direct to hard disk, in 24-bit colour or 8-bit greyscale.

Only one pass of the image is required, so scanning is fast. Results are stunning.

Also rans:

Art Department Pro
SaxonScript Professional.

Jeff Walker



PRINT AWARDS

This past year has seen printer prices plummet, no doubt partly due to the recession. You can now get a colour printer for under £200, a high-quality monochrome inkjet for under £250, a high quality colour inkjet for under £500, and a laser printer for under £600.

This market moves fast. It seems that the minute you buy a printer, someone releases a better one that costs less. The temptation is to sit back and wait, but of course the new releases are never ending, so you could sit back and wait for ever and ever.

This is why it is very important that you buy a printer that meets your printing requirements as closely as possible, because unless you are very rich you are going to be stuck with what you buy for a few years.

Many users rush out and buy colour dot-matrix printers without thinking or looking to see what they're getting. They expect to print digitised HAM (4,096 colour) images and get wonderful results.

The reality is that it takes a very long time to get something that resembles a dirty nappy. Even 32-colour images tend to come out rather 'muddy'.

But for printing text in colour and the odd few-coloured picture, colour dot-matrix printers are a cheap solution.

If you require high quality colour printing, buying a 24-pin colour dot-matrix printer is a false economy; you have to think colour inkjet at least. But don't be fooled into thinking that the word 'inkjet' means 'high quality' – it's just a way of printing, like 'dot-matrix'. Some inkjet printers only emulate 9-pin dot-matrix printers, so the output quality is low resolution. Others can print at 300 dpi, but to print shades of colours the image has to be 'dithered', which reduces the actual top output resolution to 150 dpi.

If you're looking for a laser printer, keep in mind that LaserJet support on the Amiga is poor – there's just the one 'official' driver, which was written yonks ago for the original LaserJet. There are no proper Amiga drivers yet for LaserJet II, IIP, III or IIIP emulations, not even shareware or PD ones. It might be wiser to choose a laser printer that has Epson LQ emulation, or one for which there is a specific Amiga printer driver, like the Canon LBP range.

And if you are looking for PostScript support, keep in mind that some third-party emulations are not 100 per cent Adobe compatible. If you want to be really safe, it might be wisest to buy a PostScript printer that contains real Adobe PostScript.

Lastly, if you are worried that there may not be a proper Amiga printer driver for the printer you want to buy, the very best thing to do is to ask your dealer for the phone number of the printer manufacturer, then phone the printer manufacturer and ask. If the answer is "Erm...", "Don't know" or "Probably", it might be a good idea to choose another printer. The answer you are looking for, from the printer manufacturer not the dealer, is a resounding "Yes, it's called ... and you can get it from ..."

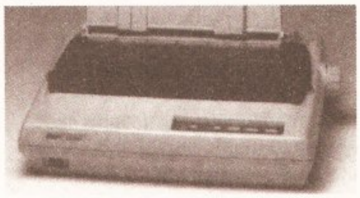
TOP PRINTER UNDER £150

Citizen 120-D+

£110

A sturdy monochrome 9-pin dot-matrix printer that has stood the test of time, first launched an incredible seven years ago.

Prints at 144 cps in draft, 30 cps in NLQ, and does 240 by 216 dpi graphics. Works perfectly with the EpsonX printer drivers. Will take fanfold or cut sheet paper.



The Star LC-200 – the best printer available for under £200

TOP PRINTER UNDER £200

Star LC-200 Colour

£170

Smashing 9-pin colour printer with five NLQ fonts. Prints at 200 cps in draft high speed mode, 37.5 cps in NLQ, and does 240 by 216

dpi graphics.

Text quality is excellent for a 9-pin printer, colour graphics dumps are better if a specialised printing utility like Flexidump or Turboprint Professional is used.

Works perfectly with Star's own Star9Plus printer driver. Will take fanfold or cut sheet paper.

TOP PRINTER UNDER £250

Canon BJ-10ex

£205

A portable monochrome bubble jet printer with three LQ fonts. Prints at between 83 and 142 cps in draft and HQ mode, and does stunning 360 by 360 dpi graphics. Works perfectly with the specially written Canon-BJ10 printer driver, or will work in Epson LQ mode with the standard EpsonQ driver (but not as well).

Don't be put off by the 'portable' label. The BJ-10ex is small, but sturdy, and perfectly capable of big print jobs. Takes cut sheet paper only, which needs to be fed in one sheet at a time by hand. The automatic cut sheet feeder, which takes 30 A4 pages is another £50.

TOP PRINTER UNDER £300

Citizen Swift 240 Colour

£270

Probably the top 24-pin colour dot-matrix printer currently on the market. Comes with 14 fonts (two of which are scalable) and prints at 200 cps in draft, 66 cps in LQ. Does 360 by 360 dpi Epson compatible graphics. A well designed control panel makes it a doddle to use. Print quality is excellent. It's also quiet.

TOP PRINTER UNDER £350

Canon BJ-20

£310

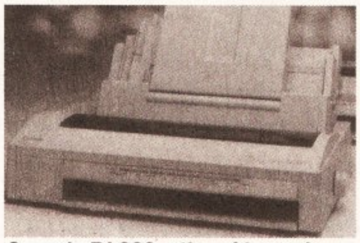
A slightly bigger and enhanced version of the monochrome BJ-10ex bubble jet, with five LQ fonts and an automatic A4 cut sheet feeder supplied as standard. Same print speeds and 360 dpi graphics resolution as the BJ-10ex. Works with the Canon-BJ10 printer driver, or with the Amiga's EpsonQ driver when in Epson emulation. A brilliant printer for both word processing and DTP.

TOP PRINTER UNDER £400

Canon BJ-300

£340

Big brother to the BJ-10ex and BJ-20 bubble jets. Comes with three LQ fonts (extra cartridges are available) and prints at a speedy 300 cps in draft, 150 cps in high quality mode, and does the usual high quality 360 by 360 dpi bubble jet graphics. Takes fanfold paper using the built-in tractor mechanism, cut sheet paper is fed into the front of the printer. The large automatic cut sheet feeder costs another £100. Works with the custom Canon-BJ300 printer driver. A wide carriage version is available (BJ-330) for about another £100.



Canon's BJ-330 – the wide carriage version of the best printer available for under £400

TOP PRINTER UNDER £500

HP DeskJet 500 Colour

£480

The best quality colour printouts you are going to get at this price. The big problem with the DeskJet 500C (and the new 550C) is that there are still no proper Amiga printer drivers for them, so you are limited to what you can print by the quality of a couple of "PD" printer drivers being distributed by dealers, one of which is actually a beta-test version of the new DeskJet driver Commodore has been developing for Workbench 2.1.

Turboprint Professional comes with a DeskJet 500C driver, and this is probably the best thing to go for as it hijacks Workbench Preferences and allows you to play with colour correction, without which output from the 500C is poor. We'll have to reserve final judgment on the colour DeskJets until Workbench 2.1 and/or proper printer drivers are released.

TOP PRINTER UNDER £600

Epson EPL-4000

£575

A 300 dpi laser printer with 13 fonts that emulates LaserJet IIP, Epson FX-80 (9-pin dot-matrix), and Epson LQ (24-pin dot-matrix). Comes with 512k of memory, which is enough for word processing but not really enough for DTP. Another 1Mb will cost about £80. Prints at 6 pages per minute. Replacement toner cartridges are about £50.

The EPL-4000 appears to have been superseded in the shops by the EPL-4100 (about £650), which has an added Epson GQ emulation and an extra 11 scalable fonts. As there is currently no Epson CG printer driver for the Amiga, these extras are difficult to use. However if you hunt hard enough you should definitely be able to track down the better value EPL-4000.

Jeff Walker



1992 was, unfortunately not a very good year for business software on the Amiga.

Ever since Commodore introduced the Amiga, it has been marketed partly as a high-performance business micro and partly a games machine.

In the days when the Amiga first appeared it was a world-beater– better and cheaper than all the comparable competition.

Given this, why has the machine failed to make any real impact in the business world? One might speculate the machine is not good enough– but I have come to believe the problem runs deeper than that.

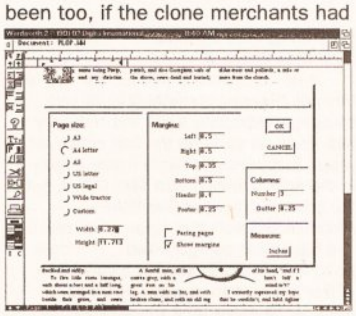
The word is technofear: people are rarely ready to embrace something new unless it is pushed on them. Do you remember the furore caused when computers first became standard office equipment?

For many people that memory is still painful and those who could not graciously make the transition have fallen by the wayside into obscurity.

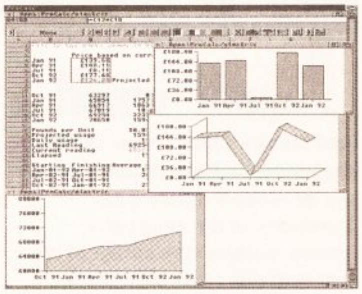
But that is not the end of the story: pick up one of today's business computing magazines and flip through it. The chances are you will not see the vaguest mention of "home" computers like the Amiga.

The painful crunch for some of my peers is no more different than it was for those early pioneers. They stolidly refuse to let go of the ancient technology– constantly prattling about new super-PCs– because they "feel" safe with the idea of a computer they grew up with: IBM's PC and its many imitators.

The PC should have been put out to pasture long ago– it would have been too, if the clone merchants had



***WordWorth 2* wins the award for best word processor of the year**



With its great graphic capabilities, *Pro Calc* proved to be the best spreadsheet of 1992

not seen an easy way to make a quick buck. Yet time after time, within months of the "latest and fastest PC's ever", a new bunch arrives– just that little bit better.

Off go the same "experts" predicting the next line-up will be that much better– and businesses get left behind in a wash of MHz and confusion.

This sort of single-minded, myopic attitude steers public opinion. If newspapers have political bias– then so do mainstream "multi-format" computing magazines– only theirs is potentially more dangerous.

The eerie part of it is that it has gone on almost unnoticed for years: and this attitude is paralysing progress. Like the children of Hamlin we follow the piper and believe what we read– if journalists give something enough coverage, it will become the norm.

This may be acceptable in single format publications but it most certainly is not acceptable from the larger houses who purport to inform.

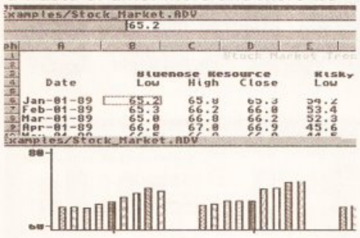
These experts gaze through their gold-rimmed spectacles at the poor chap with his £400 Amiga forgetting the same machine cost millions of dollars and thousands of man-hours to develop. Not so the latest PC– developed from the same tired technology with a few tweaks here and there. A machine which, no matter how powerful, is still limited to 640K base memory– confused and added to with all manner of fancy cards and software solutions.

Sound is all but none existent in most standard designs, but worse still no one can really agree on the screen resolutions. As soon as IBM

bring out a standard set– everyone else brings out their (usually incompatible) own.

Programmers, as always get around these deficiencies and the PC has, without doubt, been the launching pad for many great applications.

Business on the Amiga has, until now, been a trivial pursuit– but never a waste of time. More and more we



Gold Disks's *Office 2* wins the best integrated business package award

see developers realising the importance of the Amiga as a serious machine: the advent of low-cost hard disks has seen to that. Higher end machines are sold with hard disks as standard– just as any serious machine should be.

The launch of Workbench 3 with the A1200 and A4000 sees the machine with more power, colour and speed than ever before– and even the humble 68000-based machines out-perform similar priced PC systems by several hundred percent.

At last the software is starting to catch up with the hardware. Already we have seen Gold Disk's *Professional Calc* and Oxxi's latest LAN-compatible *Superbase*. Two products which light the way for real business use on the Amiga. Integrated systems like Gold Disk *Office 2, Platinum Works and Mini Office* all offer cost-effective software solutions at a fraction of the price required on other platforms.

Digita and Softwood both have world beating document processors that can rival hugely expensive systems on the Mac and PC.

More important though, rarely does the dinosauric PC world invoke a genuinely new idea. At some point we have to let go of old technology and welcome in the new– otherwise we cannot go forward.

Retain downward compatibility, certainly, but move on– leave the past behind; nostalgia and ancient designs are not for the young.

The future of the machine is secure– but it will take you, dear reader, to believe in it and only then can it succeed and put the other platforms into true perspective.

Mark Smiddy

BUSINESS AWARDS

Best Word Processor: Wordworth 2

Digita's acclaimed *Wordworth* gets a sequel with loads more features and, at last, support for a decent outline font set. Something it probably should have had all along. Vying for a place at the top is *Final Copy 2*– the official UK version of Softwood's *Final Copy*. According to some informed sources though, *Final Copy 2* is not as stable as it should be.

Strictly speaking, *Final Copy* and *Wordworth* are in truth document processors: true word processors are few and far between. The best Amiga word processor remains *Protext*, which has recently been reduced in price by quite a large margin. *Protext* is not suitable for beginners because it's so incredibly powerful– in some respects it is more like a programming language than it is a word processor. The best true word processor in terms of ease of use and accessibility remains Gold Disk's, *Transwrite 2*.

Best Spreadsheet: Professional Calc

Far and away the best Amiga spreadsheet of the early 90's was Gold Disk's *Advantage*. This received a new name and a complete face lift to bring it more into line with Workbench 2's, 3D bas-relief look.

Pro Calc not only looks much more professional than its predecessor, but gets a whole host of new features which make it easier to use and more versatile into the bargain. Many of the most used functions are accessible from a "ribbon" toolbar located at the top of the screen. Cell cut and paste was also rationalised to bring it more into line with systems on other platforms.

The Disc Company got hold of the rights to *Maxiplan* again, releasing the latest as version 4. However the new one, although fast, still retains the ancient and outdated looks of the original version along with many of the old bugs. *Maxiplan* has a long way to go before it can think about competing with Pro Calc.

Best Database: Superbase Professional 4

I am a little dubious to award the crown of best database to anything as things stand right now. Since Oxxi-Aegis took over development of *Superbase* they have been slow to the point of being laggard in distributing upgrades and bug fixes to registered users.

What has happened to the much rumoured *Superbase Personal 4* which is supposed to have the form designing facilities of *Professional 4*, but with the DML (programming language) removed; and what about the run-time module and LAN versions?

All these are supposed to be out in America but there seems to be no sign of them this side of the pond. For general purpose use you can't do much better than *Superbase Personal 2* which is still readily available.

Best Integrated System: Gold Disk Office 2

It never ceases to amaze me, Digita has not released something to fill this category– especially since the company has come on so far in the last couple of years. Europress Software made a stab in the right direction with *Mini Office*, but the price matching of *The Works Platinum* knocked that clean of its perch. The top of this category must, therefore, go to Gold Disk. *Office 2* is a collection of five better than average modules which go to make up a value-for-money office kit.



HARD DRIVE AWARDS

Just a few short years ago, anyone in possession of a hard disk was considered to be (a) an elitist (b) very rich or (c) both. These days nothing can be further from the truth. Hard disks are no longer the preserve of wealthy enthusiasts, but an essential commodity for today's Amiga.

I'm not about to suggest everyone can afford a hard drive, but it should be considered instead of printer or a couple of extra floppies. The choice rather depends on what you use the machine for, but a hard disk transforms the Amiga into a completely different machine. Consider this: it is almost impossible to sell a PC clone without a hard drive!

Amiga Shopper award for Technical Excellence: GVP HD8+

What can I say about this classic machine? Despite being a SCSI device, it is still one of the fastest A500 hard drives around. GVP mated one of the fastest widely available hard disks around with some of their own technology. The DMA-based design dumps bytes into memory without any processor intervention– so the faster the controller can read (or write) the hard disk, the faster overall the machine will be. Speed is not the only thing in GVP's favour though– it looks like it was designed by Gigaro and mates perfectly with the A500 casing. A design often copied, but never equalled by anyone else.

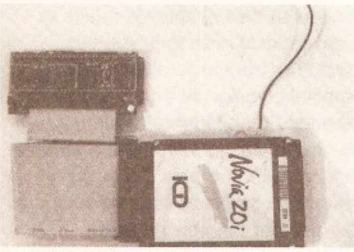
Amiga Shopper Award for Innovation: GVP A530

There is little to fault the A530. On specifications alone it is a superb machine which combines all the best expansions: hard disk, RAM, accelerator and PC-emulation "in one handy bottle" to use a totally unrelated advertising clich. The 530 blends a brilliantly engineered hard disk sub-system with a tremendously fast (40MHz) 68030. This sort of computing power takes a humble A500 to almost twice the speed of an A3000. Using this sort of performance, the otherwise sluggish



GVP's HD8+ is one of the fastest SCSI hard drives around for the A500. Its DMA-based design means it can bypass your Amiga's central processor and thereby ramp up throughput. It also looks pretty neat too..

AT-Once board should perform quite well too! When I see products such as this one– and look at the PCMCIA slot residing on an A1200 I could almost cry!



The Novia 20i – ICD's compact, internal hard drive for the A500

Amiga Shopper Award for Technical Excellence: GVP G-Force

If the A530 made your jaw hang longingly in your beer, the latest combo board for A1500 and higher machines will be a shock!

The G-Force 33Mhz 68040 out-performs the A3000 by a factor of four. It can even be expanded to 16Mb of Fast RAM.

Of course, this sort of kit does not come cheap– but if you need ultimate performance it certainly appears GVP are setting the future trends.

Expect to pay around £2000 for a fully configured system with 4Mb of 32-bit RAM.

And of course, the same people offer a range of lower performing systems to suit most pockets– and all these are subject to the same commendation.

To date I have not seen one of these latest GVPs running but my conclusion and recommendation is based on the company's excellent previous performance.

Amiga Shopper Award For Innovation: ICD Novia

What can you say about a hard drive that's small enough to fit inside the case of an A500 complete with it's interface and doesn't require removal of the internal floppy? Wow! Amazing! I don't believe it! ICD specialise in cost effective micro technology, and I would argue Commodore borrowed the idea when they designed the A600HD.

The Novia is not necessarily the best thing since sliced bread, but it solves the space problem in an interesting way.

Amiga Shopper Budget Bronze Award: Roctec RocHard

Quite a few people blew raspberries at Roctec when the interestingly named RocHard finally hit the streets– the first units only accepted certain IDE drives while at the time everyone was thinking in SCSI terms.

Roctec had already thought of this and provided SCSI as a user upgrade.

Early units were fraught with problems thanks to some minor design howlers, exploding power supplies and a below average formatting software but these have finally been sorted out.

The RocHard stands above the GVP HD8+ in some respects because it accepts standard, widely available 1Mb x 8bit and 1Mb x 9bit SIMM modules. (The GVP systems only accept 1Mb x 8/9bit or proprietary GVP 4Mb SIMMS.)

Also, thanks to its non-DMA design the RocHard can be used as a memory expansion or just switched off altogether.

It is interesting to note Roctec's thinking with this design, since Commodore selected the very same IDE interface for the A600 and A4000 machines.

RocHard may not be the mainstream, GVP-bashing, device Roctec had hoped for but remains a good enthusiasts choice.

Mark Smiddy



Roctec's RocHard provides a budget-conscious alternative to the GVP range of hard drives offering fast IDE capability and easy memory upgrading. As it's not DMA , the RocHard can be also used solely as a memory expansion



Remember the sales blurb that came with your machine about all the expansion potential it offers and wondering why you believed all the sales blurb?
The Amiga is one of the most expandable micro computers ever built– here is just a small selection of the best of what is currently on offer.

Amiga Shopper Award For Innovation: KCS Power PC Board

It is difficult to characterise the KCS device exactly, but no company can be adjudged to have put as much effort in adapting their hardware for different platforms. At the time of writing the KCS Power PC board is available for all Amiga models except the long-discontinued A1000 and A1200. Since Krijn Kolff was seen leaving the Future Entertainment Show with an A1200 under his arm, I expect that little failing will soon be remedied– probably before you read this.

Installing the Powerboard on A500 machines couldn't be simpler– just pop it in the trapdoor expansion slot and boot the software. On the latest models such as the A600 (and A1200 I expect) the Powerboard is sited below the machine in a custom case. For larger models, the board fits into a separate expansion adapter so it can fit into one of the Zorro slots. The Powerboard's only downfall is that it does not comply to the bridgeboard standard, and therefore, cannot access external PC cards such as VGA adapters– all of this has to be addressed in software.

Amiga Shopper Award for Innovation: Switchsoft Expansion

In the halcyon days of the BBC micro, experimental expansion was the thing to do– with such things as robots, wind speed and pH (acidity/alkalinity) measuring gear almost commonplace. It's strange to think then why developers have been so slow to harness the Amiga's undeniable power.

All that is set to change now as North East-based, Switchsoft have developed a range of interfacing projects for the machine. The basic unit, costing under 30 quid, provides up to 13 digital inputs and digital 11 outputs plus two analogue inputs. These can be interfaced to your own projects with the software supplied, or to a variety of devices including a robot, mains control unit and multi-project experimenters kit. The obvious place for these would be in education, but they are also invaluable for the enthusiast who feels lost without his "good ol Beeb".

Amiga Shopper Award for Technical Excellence: Roctec Roclite

Roctec was the first company to recognise people wanted more from a floppy disk drive than a slot to put a disk in– so they produced (to use another tired cliche) the incredibly sexy Roclite. Roctec solved the problem of ugly casings with a custom cast, anodised aluminium affair which fits a super-slim Citizen drive like a glove. The interface electronics fit neatly the back and connect to the Amiga via a custom moulded plug.

The overall effect is so artistic, I fully expect the drive to appear in an exhibition at the Tate. The latest version comes with an anti-click and switchable anti-bootblock virus protection and is available in matte black or ivory colour schemes. Roctec's best design to date by far.

Amiga Shopper Award for Technical Excellence: Pheonix A600 RAM

Internal RAM expansions may come and go, but the Pheonix one (which sadly escaped our last RAM round up) has got to be one of the best around. Very little can be written about this little board– apart from it offers A600 users the option to expand to a full 2Mb CHIP– and it has been built with technical expertise that puts others to shame. Enough said.

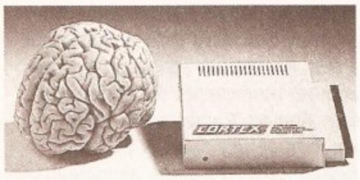
Amiga Shopper Award for Technical Excellence: Cortex 8Mb

Although not the best looking RAM expansion for A500 and A1000 machines, Cortex is the only one I feel confident to recommend. From the outside the steel box takes the biscuit for being square (in fact it

looks like a biscuit tin). But just open the box and take a look inside at this fine piece of engineering. The Cortex unit is simple to expand with 1Mb SIMMs and a throughport provides for an external hard drive or other Autoconfig device. If everything was constructed with as much care as this little gadget, the world of computers would be a lot more reliable to work in.

Amiga Shopper Award for Technical Excellence: ICD Flicker Free Video

If one thing is a real problem on the Amiga it's the flickering of interlaced screen modes. Fixing this is not a real problem if you have a larger Amiga and plenty of money to throw away on a special video card with a multi-sync monitor. The card solution is a problem on the A500 machines– because Commodore did not provide such an interface, but ICD have somehow managed to squeeze a large amount of RAM and all the scan doubling hardware on a little board that fits inside an A500! You'll still need a special monitor but it's worth it if CAD is your scene and you don't want to invest in a bigger machine.



Technically excellent: ihe Cortex 8Mb RAM expansion card

Amiga Shopper Award for Innovation: Omega Sound Enhancer+

This is a cheeky little gadget– and if I could give a category for impudence, this would win! The Amiga's sound is no longer its best feature, but it can be improved and this is exactly what the Sound Enhancer+ does. It isn't some high-flouting piece of hi-tech sampling hardware, nor is it some plug-in card (like the infamous PC soundblaster). Sound Enhancer is like the loudness control on most low-cost hi-fi systems.

The idea is based on the sound (groan) theory that the human ear has an uneven response across its frequency range– about 20Hz to 20KHz in a child, falling to 10Khz or less in later life. Sound Enhancer capitalises on the fact the Amiga– and most amplifiers– cannot equalise the relative loudness of these frequencies (they are all produced at more or less the same volume) and boosts them for you. The result has to be heard to be believed. Sure, it's cheeky, but it works– all congratulations to Omega for thinking of it.

Mark Smiddy



Yes folks it's our end of year Amiga Shopper award time again and on the MIDI/music front here are the results...

Music Package of the Year – SuperJAM

The Amiga had a slow start in the MIDI/music world but whilst it is now clear that the quality of Amiga MIDI/music software is improving there is no doubt that there is still a significant gap between the quality of the software available on the Amiga and that available to ST/PC and Apple Macintosh users.

Last year however a program did appear on the Amiga that caused a sensation because it was actually better than offerings available on the Atari ST – it was of course Blue Ribbon Soundwork's brilliantly programmed *SuperJAM* package.

This music composition program can work out drum patterns, bass parts and piano/keyboard backing (complete with fills and variations) for a whole band using a particular style and then play it using either the Amiga's internal voices or via MIDI.

SuperJAM gets our 'Music Package of the Year' for four reasons.

Firstly, it is an extremely innovative package that not only does what it is supposed to but shows the advantages of the Amiga's multi-tasking and multi-windowing environment to the full.

Secondly, it is a program which can be used to good effect by almost anyone – *SuperJAM* can turn non-musicians into musicians, poor musicians into good musicians, and because it can save time it even appeals to professional musicians.

Thirdly, it is flexible – the program has been designed so that either the Amiga keyboard or an external MIDI keyboard (or both) can be used to enter data and since it can use internal sounds and/or MIDI anyone can use it regardless of their available music hardware.

And lastly, but by no means least, *SuperJAM* showed that there's no reason why music-wise the Amiga can't knock hell out of the ST!

Of course there were many other things about *SuperJAM* that we liked. ARexx support, Bars & Pipes sequencer integration, and a host of other musical and technical goodies all led us to the opinion that this had to be the music product of the year.

Best Music Buy of the Year – OctaMED Professional

With a price tag of only £22.50, or £12.50 if you were upgrading from the earlier *OctaMED V2, OctaMED Professional* had an almost unfair advantage over other commercial MIDI/music offerings in this 'Best Buy' award category.

Tracking, ie composing and creating sample based songs for playing via the Amiga's sound chips, is one of the oldest of the Amiga's music areas and this program, although almost completely re-written since early Amiga days, did of course have its roots in MED the Music EDitor program.

Nowadays the program has grown almost out of recognition although it still uses the basic 'tracker' approach which allows songs to be created by defining and linking smaller blocks of music.

However you are not limited to just the original MED Block Editor style of data entry. An alternative approach is the Graphic Notation editor which lets you enter, edit, play and print music using stave notation.

The editor functions superbly and of course having entered music in conventional note form you can switch to the block editor to add any special commands that might be needed. In addition to this there is a Synthetic sound editor and a sample editor and there's no doubt that having a sample editor available is a big plus for the new program because it allows you to remap sample frequencies and do all the usual types of ranged cutting/copying and paste editing without ever leaving the *OctaMED Professional* environment.

It also allows you to collect samples from any standard parallel-port sampling hardware. One other editor, the Sample List editor, is also available for storing details of instrument names and locations. In addition to all this you also get things like the *OctaMEDPlayer* program.

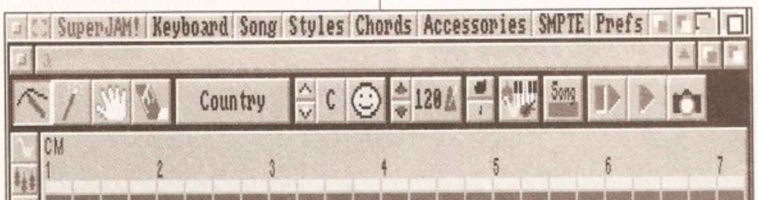
OctaMED Pro has some good documentation on disk (which includes quite a lot of information for programmers) but there is now also a printed user-guide available.

Quite simply there's nothing to beat it on price and it is heartily recommended it to anyone who needs a decent tracker!

Best 8-bit Sampler Package – Audio Engineer Plus

There is still nothing to touch this Ramscan/GSOFT offering and it is generally acknowledged to be the best 8-bit Amiga sampler package available at the current time.

Unfortunately it is also the most expensive. The stereo digitizing unit



Blue Ribbon Soundworks' *SuperJam* – the brilliant music composition program that is extremely easy to use, yet very powerful, and which wins Music Product of the year. With ARexx and sequencer support li's also knocked spots of the ST's custom music software.

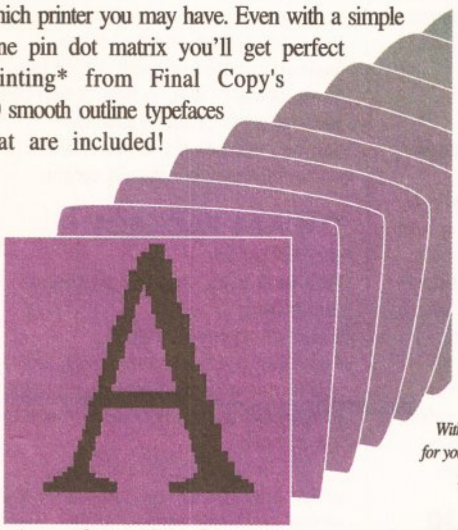
Due for release during September 1992

THE FINAL WORD

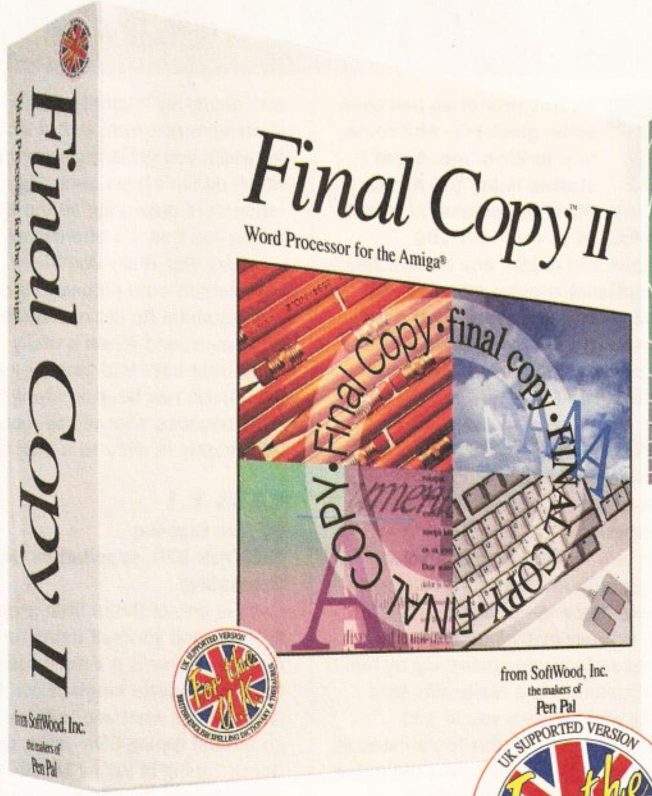
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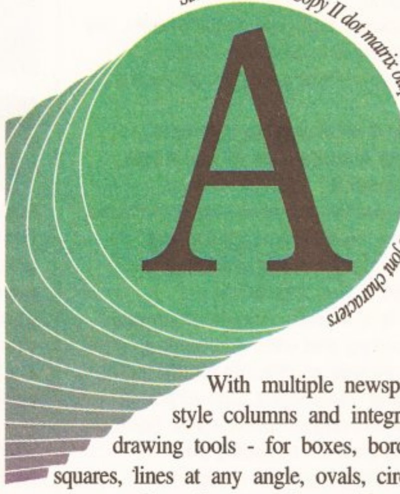
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AMS

includes two separate, and fast, A/D (analogue to digital) converters and the hardware, which is capable of sampling rates in excess of 300K samples per second.

It also contains switchable microphone and line inputs, signal level adjustment, and printer switch-thru connections. *Audio Engineer Plus* is the 8-bit sampler by which all other 8-bit Amiga samplers are judged!

Audio Engineer II incidentally, the software provided with *Audio Engineer Plus*, gets its own award...

Best 8-bit Sampling Software – Aegis AudioMaster IV and Audio Engineer II

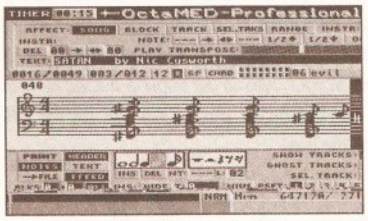
This award is shared simply because Ramscan's *Audio Engineer II* is essentially the same package as Aegis's *AudioMaster IV*.

It is a brilliant piece of sample recording and editing software.

As well as offering all the usual editing, resampling, and effect-creation options provides all sorts of other goodies including time-stretching and time-compression, and software-filter based frequency cut and boosting facilities.

Best Amiga Music news of the Year – Microdeal's Clarity 16

Jumping the gun? Yes, but why not – 8-bit sampling resolution has limited the interest in Amiga sound sampling for long enough and the prospect of 'affordable' 16-bit sampling has got to be something to shout about.



***OctaMED Professional* – at only £22.50 it's got to be one of the best value music products ever released. Tracking and sequencing samples has never been easier**

Clarity 16 is the first low cost hardware+software stereo 16-bit sampler to be produced for the Amiga – it will probably be available by the time you read this and it is going to provide a 16 bit system that can sample at up to CD rates – an impressive 44.1 KHz. The software will convert between 8-bit and 16-bit formats (using 8SVX, AIFF and AVR formats as far as we can tell) so you will still have IFF 8-bit support as well as some new 16-bit file formats.

Samples will be able to be played both through the stereo 16 bit cartridge output or through the Amiga's standard output channels and the hardware will include an integral MIDI interface.

Paul Overaa



The last year or so has seen some great PD– and some real turkeys, too. Since I started doing the Amiga Shopper PD World column in March, I've looked at well over 100 programs in depth, and (with a few exceptions) they've all had their good points. But some have really stood out; on this page are some of my personal favourites, in no particular order.

TOOLSDEAMON 1.0

By Nico Francois
Fish Disk 561, supplied by Unique Computing

Nico is a familiar person on the Amiga shareware and (more often) freeware scene– at times it seems that virtually every Fred Fish disk released features something by him. *Toolsdeamon* is a really nifty little utility which allows you to add program names to the Tools menu in Workbench 2.0; just select the name and the program automatically launches. Adding program names is as simple as just dropping an icon on to the ToolsPrefs window, which automatically generates the commands needed to run the program.

TERM 2.0

By Olaf Barthel
Fish Disk 534, supplied by Unique Computing

This giftware program (send him a gift if you like it) is great. Although many Amiga users have stuck with *NComm*, the most popular Amiga comms package, Term outstrips it in terms (no pun intended) of looks and features. It requires Workbench 2.0, and supports ARexx, any Amiga screen mode and any transfer protocol libraries which you have installed (it comes with things like XModem, ZModem and Kermit supplied). It will even narrate your session for you, using the Amiga's speech synthesis feature.

TEXT PLUS

By Martin Steppler
PDSoft disk V261

In May I took a look at three of the best PD and shareware word processors available, and *Text Plus* was easily my favourite. It's a shareware program, with a £15 fee– for which you get a registered version which doesn't have annoying requesters appearing all the time, telling you that it's shareware.

Text Plus really does rival commercial word processors on many counts; its list of features goes on forever, and it has a really inpressive user interface– it looks like Martin has been studying the Mac, because a lot of the requesters look mighty familiar to a Mac user.

CASS 1.1

By Jorn Clausen
Fish Disk 579, supplied by Unique Computing

Cass is one of those little programs that you find yourself using time after time. It performs a simple function: to print cassette labels. Now, I don't for a minute want you to think that I go around taping CDs– after all, Home Taping Is Killing Music.

However, for those 90 minute records of bird noises in the garden, neighbours having rows and so on that I record, *Cass* is invaluable.

MAGNETIC PAGES 1.30

By Mark Gladding
PDSoft disk V688

Anyone who is considering creating a disk magazine should immediately get themselves a registered copy of the shareware *Magnetic Pages*. It's a full disk mag creation package, and I'm astounded that more disk mags aren't using it.

It is based on the concept of electronic pages, and allows text and graphics and sound to be incorporated on any page, along with buttons to branch to other pages. *PowerPacker* can be used, so you can fit more on a disk, and things like page colour, text and text box colour, drop shadows and borders are all totally under your control. *MED* and *SoundTracker* are both supported, so you'll have no problem incorporating music into your mag.

FILEMINDER

By Joel Swank
PDSoft disk V573

This $10 shareware program is the nearest thing to *XTree* for the Amiga. *XTree* is a famous PC disk navigation utility from the days when Windows was just a glimmer in Bill Gates' wallet, and is well loved by all who've used it. Although *FileMinder* is obviously different in some ways (we wouldn't want any nasty copyright lawsuits, now would we) it is easy to use, and makes finding files and moving them about a dream. It has its limitations– there's no facility to view IFF graphics, although you can view text files– but that's not the point. The point is that everyone with a hard disk should have a copy of this program.

LHA

By Stefan Boberg
Various suppliers

OK, so file compression utilities aren't the most exciting things in the world. But they are certainly necessary– as anyone who's downloaded a non-compressed file from a bulletin board will tell you. Although not the most widely used program (an accolade which goes to the older *LHArc*), it's by far the fastest compression utility that I've come across– and, in fact, it can be persuaded to produce *LHArc*-compatible files if you can master its rather complex command syntax.

THE A64 PACKAGE

By Cliff Dugan
Fish Disk 555, supplied by Unique Computing

If you've upgraded from a Commodore C64 to the Amiga, or if you're nostalgic for the bygone days of computing, this one's an absolute 'must have'.

It's a superb C64 emulator, which provides an almost exact copy of the real thing on your Amiga. And registered users (the registration fee is about $45) receive a hardware interface which allows you to use your C64's disk drive and printer– and software which dumps the C64's ROM to floppy, so that you are guaranteed 100 per cent compatibility.

THE ELECTRONIC BABY BOOK

By Linda Lullie
PDSoft disk V658

I just had to include this one– not because it's great, but because it is probably the naffest shareware program of the year.

In it, you can record every nauseating detail of your nipper's growth to spotty adolescence, and embarrass them by not only telling boy/girlfriends all about their formative years, but also by proving that you're a complete nerd and have kept all the details on a (by then) completely outdated computer. It's unbelievably tacky.

Ian Wrigley

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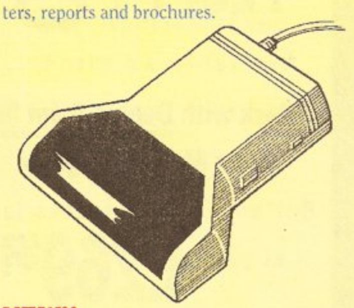
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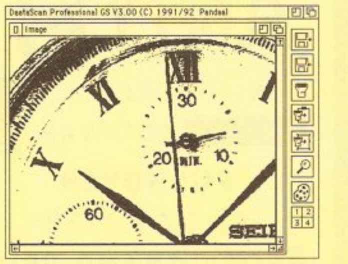
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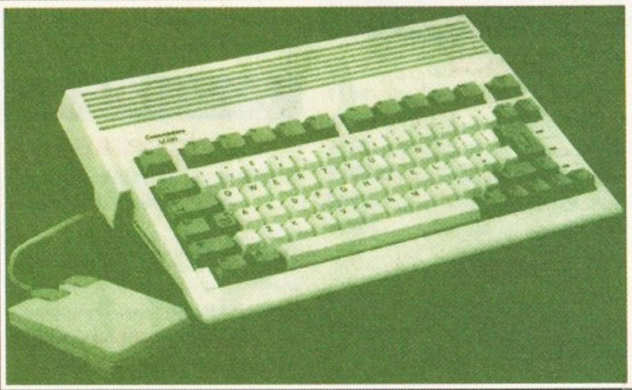
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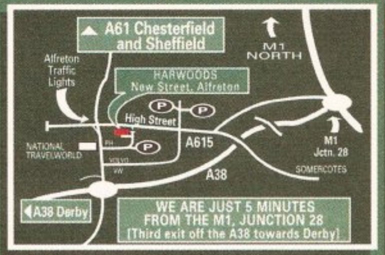
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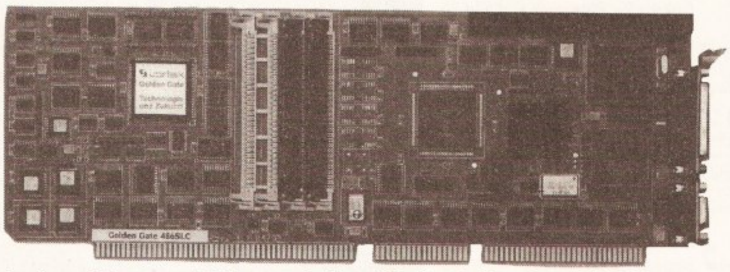
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BIG BLUE VORTEX



Put a top-of-the-range PC in your Amiga with the Golden Gate 80486!

Exclusive! The first ever '486 PC emulator for the Amiga. Wilf Rees takes the new Vortex for a spin

Having spent hours taking PC emulators in and out of A500s and A2000s (for my Issue 19 roundup of Amiga PC emulators), the phone-call from German-based Vortex came as quite a surprise. They wanted to give *Amiga Shopper* a world exclusive on the first 486 emulator for the Amiga 2000, 3000 or 4000. Named after the recently-launched 386 model, this new Golden Gate 80486SLC represents the ultimate in emulation – a PC for Amiga users which will perform as well as any 486-based machine with the same specifications.

This really represents a major landmark, and a real thorn in the side of all of those PC hacks who make disparaging remarks about our favourite machine. It means we can perform all of the so called 'industry standard' routines and run the usual quoted packages just as fast, or even faster, than PCs themselves.

NORTON SI, MIPS TESTS, AND ALL THAT

No doubt you, as I do, get fed up with all the rhetoric about "Number of screen colours" and "Compared to a basic XT...", and "Which version of *Windows* are *you* running?". Well, cop this, the Golden Gate 486SLC runs at a blistering Norton SI of 45. That's right, 45 times faster than a standard IBM PC. Now think about the fact that a standard Amiga 500 comes out at about 4.3, and you get some idea of the speed. It is 10 times faster than an Amiga 500, half as fast again as the Amiga 3000 and 2.5 times faster than the Golden Gate 386, the jewel in the crown of my earlier PC emulation review. If you want to engage in some serious number-crunching, then a socket is provided for an optional 80387sx-25 arithmetic coprocessor.

WHAT DO YOU GET?

I had half expected this new product to be a simple development of the 386 board, but not so. This is a completely new design, and as we have come to expect from German engineering, Vortex has produced an outstanding piece of kit. The six sandwich board is magnificently put together, and fits across a Zorro/ISA bus slot in the 2000's motherboard. Installation is as per the 386, and requires the removal of the 68000 CPU in order to install a CPU adapter. This is a simple double-sided socket into which the 68000 is plugged, and then the whole unit is replaced in the motherboard. The adapter is needed to accommodate a capacitor across two of the pins of the CPU, a necessary addition which enables the card to operate but in no way affects the normal working of the Amiga. (This modifcation is only necesary on the A2000.)

With the card and adapter, you also get the software and manual.

ADDED ADVANTAGES

The manual is the usual multi-language offering with over 100 pages dedicated to each. The English is impeccable, written in easy to follow, logical language, and not overburdened with technical jargon. Photographic and text-supported descriptions more than adequately describe the installation process, and a text file on the 'Goldmine' software can be printed out to help with the installation of the set-up procedures. I must admit, I never referred to either until I hit a problem, and then a quick reference to the manual put me right. The technical reference section is extremely comprehensive, providing any techno-freaks with all the data they'll ever need for possible customising or peripherals.

The software was a doddle to install on my Amiga hard disk, and within a few days of using, was replaced by an updated version. This shows that Vortex is continuing to improve the product performance.

MEMORY LINGERS ON

To get this beast going, we obviously need some onboard memory. There is no skimping in this quarter, as the board comes with 2Mb of RAM. Provision is made on the card for the installation of 1Mb or 4Mb SIMM memory modules, enabling the Vortex to be extended to 16Mb.

Flexibility in the design of the board allows you to use up to 4Mb of Golden Gate RAM as autoconfiguring Amiga RAM, extending the Amiga's capabilities. Likewise, the Golden Gate can use up to half of your Amiga RAM, though the performance of this memory will usually be slower than Golden Gate RAM – unless you're hooked up to an A4000!

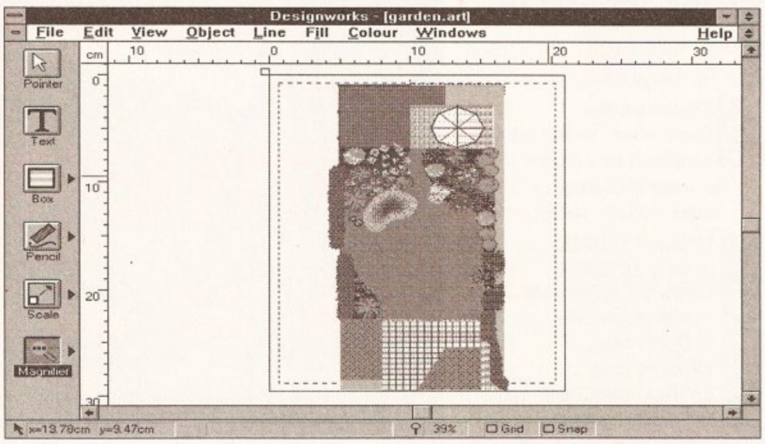
Due to the extensive facilities on the Golden Gate setup routine, the memory can be configured to either extended or expanded. Similarly, the serial and parallel ports can be configured as COM1 and LPT1.

SUPPORT FOR DISKS

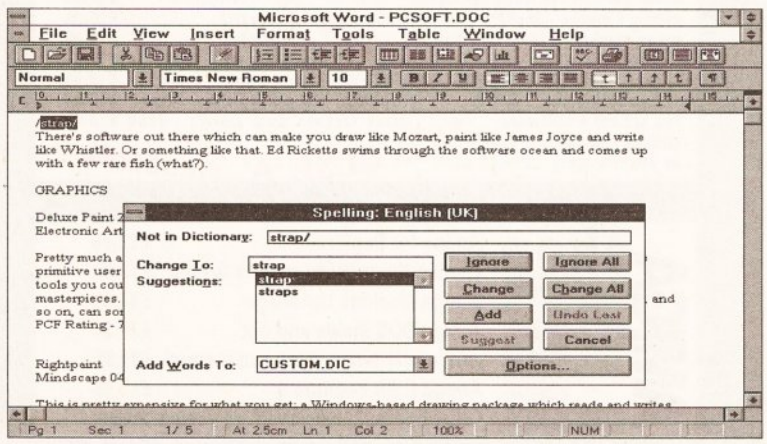
If your Amiga is equipped with a hard disk, then a hard disk partition and/or a large Amiga-Dos file can be directly assigned as an MS-DOS partition. MS-DOS can be booted directly from one of these partitions, and a total of 24 possible partitions can be installed.

Should you not wish to do so, the Golden Gate comes complete with its own IDE interface. This makes it possible to connect a separate hard disk dedicated to PC software, or partitioned to extend the capabilities of your Amiga.

The card offers the facility for using the Amiga drives as PC drives. 5.25" Amiga drives are supported, along with Amiga high density drives (found in later A3000 and all A4000s). With the addition of an 82077AA disk controller, up to three disk drives can be plugged directly into the Golden Gate. All types of drives, up to 2.88Mb, can be connected. This option offers higher disk performance than using an



Designworks shows its capabilities, having loaded quicker than ever before



Here we have the classic *Word for Windows*, running no with problem at all

Amiga drive. Vortex's philosophy of offering the floppy controller as an additional extra is one I question. Sure, if you want to save and load everything via hard disk, fair enough. But I feel that the controller should have been included in the overall price, perhaps surface-mounted for higher reliability.

GRAPHICS EMULATION

Display quality can be the deciding factor for most PC emulators. A card may have a 486 running a 50MHz, but if the display performs like a tired old ZX81, then who cares if it has 100 megs of 20 nanosecond multi-port 32-bit hyper-velocity RAM? The Golden Gate emulates most of the popular video displays, including CGA in 16 colours, Hercules, Olivetti, Toshiba T3100 and EGA/VGA monochrome. These screen emulations are quite slow, but an accelerator will help to speed up the screen update. Flicker fixing cards will cure the eyeball-itching interlace that is used in some of the more powerful resolutions.

The only way that you can see the Golden Gate perform like a true 486 is to use a VGA card in one of the ISA slots. Stand back in amazement to see your favourite flight sim, perhaps *Falcon 3*, in full detail with 256 colours out of a palette of 262,000!

MONITOR THE QUALITY

Having joined the crowd who decided to purchase a multisync monitor (in my case, a NEC Multisync II), It has looked a little absurd having a monitor serving the PC, and a Commodore 1084S attending the Amiga needs. All went well until my Commodore monitor became poorly, and I continually went through the absurd process of switching off the power, swapping the leads, and re-booting with the NEC attached to the appropriate VDU output.

A phone-call from Vortex may well resolve this problem, however, as they tell me that they have developed a device they call Monitor-Master. Apparently this is a piece of hardware which connects between the Golden Gate card, the ISA graphics card, and the Amiga RGB output. This device will be keyboard controllable, and enable instant switching from Amiga to PC. I had hoped to include this kit in the review, but unfortunately deadlines prevailed. Watch this space!

SOFT COMPATIBILITY

Along with this lush card, Vortex kindly sent me a 180Mb hard disk full of wonderful programs. *Windows 3.1* launched into action with a collection of icons heralding those famous applications we all know of and lust after. The only problem was that the damn thing was all in German, and only having Windows 3.0, I was somewhat stuck. Not to be daunted, I went down to my local dealer, David Bell of Microtec in Morpeth, and he quickly saved the day by providing the necessary disc to convert all this gobbledy-gook into English. The poor man must be sick of the sight of me!

Everything worked like a dream. The speed was blistering, and the performance faultless. If you are accustomed to operating a PC, as I do at work, I can honestly say this compared more than favourably with the humble 386 which sits on my desk at work.

During the time that I have been throwing software at the 486SLC, only one threw it back at me. This was *F-29 Retaliator* –the plane refused to take off! I also found that the re-booting sequence (with all its memory checks) occasionally decided that It did not want to go any further, but this was cured by simply re-booting again. Apart from these minor quirks, the entire machine was as stable as any 'real' IBM PC-compatible on the market.

MAKE YOUR MIND UP

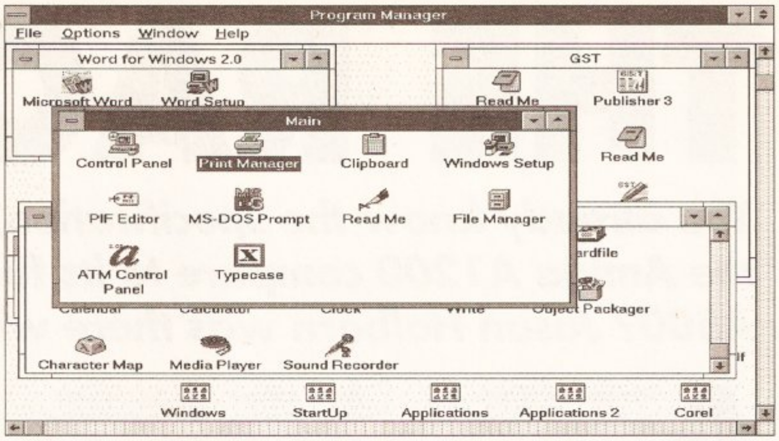
There's not really a lot to say, this is 'state of the art', quality kit, that does everything that it claims to do. An Amiga that will also do anything that even the best of the PC world can offer, but with the added ability to switch files between each other – and all under one lid. I love it, I desperately want one, but I have kept the sting in the tail until the end: the price. At £699 this is a lot of money. You gain all the benefits of not needing a whole new load of kit if you buy a separate PC, occupying all that additional space. But with the price of PCs tumbling, and 486sxs with monitor, SVGA, big hard disk, and a bundled package of software currently going for around £900, you have to ask yourself: is this really good value for money? I'm not sure. Were Vortex to offer this package for a couple of hundred pounds less, they would in all probability sell so many that the income would supersede the likely sales at this current price. Only conjecture (and time) can answer this question.

SHOPPING LIST

Vortex Golden Gate 486SLC-25MHz PC/AT Emulator....................£699

Vortex Monitor Master £79

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Not as good, of course as our Amiga GUI, but at least *Windows* works as as a poor second best. I just wish I could get this resolution without interlace!

JARGON BUSTING

AT – This is the second generation of PC computers that employ faster processors and even address memory in 16 or 32 bits. The processors involved are the 80286, '386, '486 and '586. These can be clocked at any thing up to 66 Mhz and can be up to 70 times faster than a slow XT.

MDA – Monochrome Display Adapter. A graphics adapter is a piece of hardware that allows a PC to display itself. MDA is Monochrome, which only allows text to be displayed. Graphics are not supported.

Hercules – This is a graphics adapter that is very similar to MDA, with the small difference that it can support graphics.

CGA – Stands for Colour Graphics Adapter. This type of adapter enables a PC to display in colour, with up to 16 colours of text, or up to 4 colours in graphics with a resolution of 320x200 or 2 colours with a resolution of 640 by 200.

EGA – Enhanced graphics adapter. This graphics adapter allows much greater graphics power than a CGA card, supporting up to 16 colours with a resolution of 640 by 350.

VGA – Video graphics array. This is the most popular of graphics adapters in the PC world, currently the flagship of PC graphics. It allows more memory to be fitted to the card (Super VGA) to enable a maximum display of 256 colours out of a palette of 256,000 with a resolution of 1024 by 768. This all might seem very nice, but any software emulation of this adapter on an Amiga would have to have its wings clipped. The Amiga can only display 16 colours at its highest resolution (640 by 512). Normal VGA allows a maximum of 640 by 480, so this is all the software emulations will support.

ISA Bus – (Industry Standard Architecture) This is the place in a PC where all the expansion cards are plugged into. As such, it performs a rather similar function to the ZORRO slots on an A2000 or 3000. If you've ever opened up an Amiga 2000, you will see on the top left-hand area of the motherboard there is a few extra expansion sockets. This is an ISA bus. An XT PC using the ISA bus will communicate with expansion cards in 8 bits per data movement, where an AT will communicate in 16 bits. Occasionally, '486 PCs will have EISA buses (in other words, the Extended Industry Standard Architecture). This allows the processor to communicate with expansion cards in 32 bits per data movement.

Expanded memory – When PCs were first thought of, they were limited to being able to address 640K of memory. Expanded memory provided a way round this, but due to the versatility of extended memory, expanded is not as popular as extended.

Extended memory – This is memory above 640K on 80286 processors and above. It is used by more applications than expanded memory. This type of memory is usually a fair degreè faster than extended.

THE RACE IS ON!

You already know the specification, but how does the Amiga A1200 compare to its forerunner, the A500? Jason Holborn was there with the stopwatch

After months of hype and speculation, Commodore has finally released the Amiga A1200, a machine which it is badging as the "next generation in Amiga technology". Sporting 2Mb of RAM, a zippy 68020 processor running at 14.2 MHz, true 32-bit architecture and those infamous 'Double-A' custom chips, the Amiga A1200 certainly seems to be a machine to be reckoned with.

You've probably already read the specification of the new machine in countless other articles (if you haven't, then check out last month's issue), so we thought we'd approach the machine from a slightly different angle. The Amiga community has been getting along quite swimmingly with the 'classic' 7.14 MHz 68000-based Amiga for over seven years now, so is all that extra power really needed? What advantages can that extra spurt of speed give? Will it speed up ray tracing? How about 3D modelling and general operation? Now, in what must be one of the most revealing reviews of a new Amiga ever, we present the answers to these questions and more...

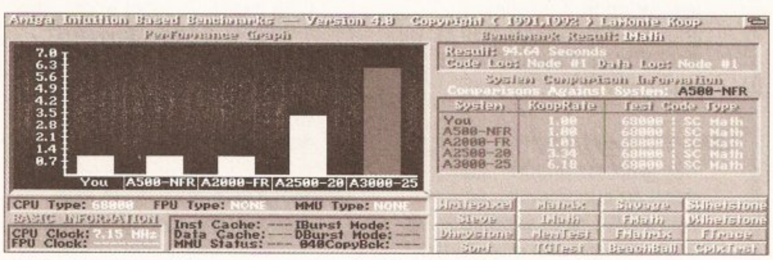
BENCHMARKS

Some people swear by system benchmark figures, so below you'll find a selection of benchmarks for you to compare. The figures were taken from both the A500 and the A1200 using the PD benchmark program, *Amiga Intuition Based Benchmarks* (AIBB) – the same program that we used to compare the processor accelerators reviewed in last month's issue. As an indication of how the A1200 compares to a 68040-based machine (the Amiga equivalent of a Ferrari F40), we've also printed the A4000 results from last month's issue (Figures 1-4).

DESKTOP PUBLISHING

Ask veteran Macintosh DTP users for their main complaint about the Amiga desktop publishing software and you'll hear the same old tune over and over again – why is Amiga DTP software so slow? Thankfully programs such as *Professional Page* certainly do benefit from the A1200's faster processor, but the speed increase still isn't enough to make using *ProPage* quite as smooth and enjoyable as, say, Macintosh *QuarkXPress*. The *ProPage* user interface certainly benefits from the A1200's 32-bit operating system though – *ProPage's* numerous requesters pop up onto the screen faster than a speeding bullet. Screen update is a vast improvement over a standard A500, but you can still be left waiting a long time when working on documents containing a lot of Compugraphic text.

Rumour has it that Gold Disk are shortly to release update versions of both *ProPage* and *ProDraw* which will be able to benefit from the machine's new Double-A chip set. In theory, this should allow *ProPage* to display picture boxes in full colour, instead of the monochrome representations that we've grown accustomed to. Rest assured that we'll bring you a full review as soon as they arrive.



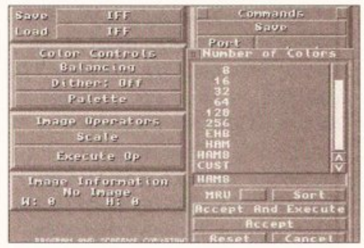
All the benchmark figures were found using the PD program AIBB

DESKTOP VIDEO

The A1200's new Double-A chip set should really come into its own when applied to desktop video and indeed any application that requires colourful high resolution graphics to be displayed at high speed. Unlike previous chip sets, the new Double-A chip set is capable of displaying animations at a full 25 frames per second regardless of the display mode (providing you have the memory, there's no reason why you couldn't animate a 262,000 colour 1280 by 512 pixel bitmap!). This sort of high speed animation capability is certainly good news for both animators and videophiles alike, giving resolutions much closer to broadcast quality. Desktop video and animation programs should soon start to arrive that support the new screen modes.

The increased colour palette is also great news for anyone working with digitisers and scanners. Grey scale hand scanners should theoretically be capable of producing up to 256 shades of grey whilst colour digitisers and flatbed scanners will be capable of producing images with higher quality shading. Consider this – if the previous chip sets offered a maximum palette of 4096 colours and the new chip set offers 16.8 million colours, that roughly equates to an extra 4096 (yes, 4096!) colours to choose from for every colour offered by the old chip set. Pretty impressive stuff.

IMAGE PROCESSING

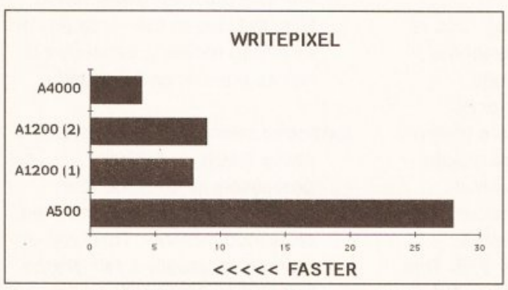


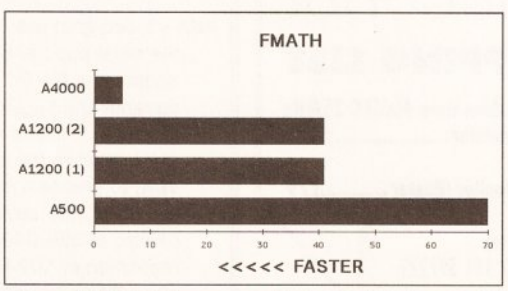
ASDG's *Art Department Pro* already provides direct support for the 1200's new chip set

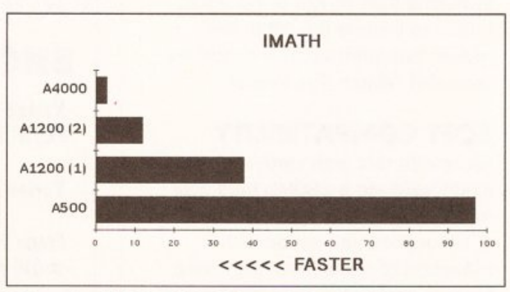
If you're working with 24-bit graphics, or indeed any form of graphics, Image processing will no doubt play an important role in your life. An Image processing program uses advanced mathematical formulae to perform complex operations on image files ranging from fairly simple scaling to image conversion, cropping, colour optimisation, and so on. But like all applications that employ complex mathematical operations, image processing takes time. So how much faster can the A1200 carry out such tasks?

As a test, we loaded up ASDG's excellent 24-bit image processing program *Art Department Professional* on both machines. We then fed both an identical 340K 320x512 pixel 24-bit image and carried out a couple of common image processing tasks – scaling and image format conversion. For the scaling option, we reduced the size of the 320 by 512 pixel down to just 160 by 160 pixels. Then, using the bitmap at its original size, the 24-bit image was converted into a HAM-8 image (Figure 5).

One thing to note here is that the current version of *Art Department Pro* (version 2.1) provides direct support





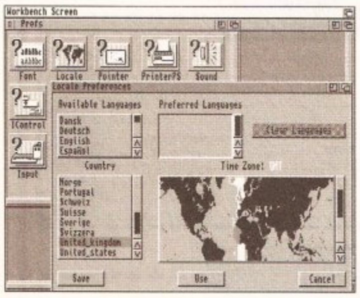


Figures 1-3: AIB benchmarks (in seconds) for the 3 machines. A1200 (1) were carried out with standard 68000 code, A1200 (2) with optimised 68020 code

for the A1200's double-A chip set, so it's actually possible to view your 24-bit images in up to 262,000 colours, giving a much better idea of the quality of the 24-bit image. In some ways, there's no reason why you should ever need a 24-bit display card with the A1200 – providing you don't need massive screen resolutions, the double-A chip set's new HAM-8 screen modes are a good (and cheap) substitute.

WORKBENCH 3.0

The A1200's new Workbench version 3.0 is certainly a vast improvement on both Workbench 2.04 and – in particular – Workbench 1.3. Thanks to the operating system now living in 32-bit RAM, the entire Workbench environment benefits from the A1200's faster processor. Windows, gadgets and requesters are drawn at a lightning fast pace, making Workbench appear not only smoother, but more professional too.



Workbench 3.0's new Locale feature turns the Amiga into a truly multilingual machine

To the casual user, Workbench 3.0 doesn't look that different from Workbench 2.0, the version of Workbench now regarded as the *de facto* standard. Upon closer inspection though, you'll notice a couple of very nice changes and additions. Probably the most documented new feature of Workbench 3.0 is the inclusion of Consultron's *CrossDOS*, a device driver which allows Amiga users to read and write to PC-format diskettes from within any Intuition-based application. Workbench 3.0 also fully supports the new Double-A chip set, allowing you to increase the maximum number of colours that the Workbench screen uses from 16 (under Workbench 2.04) to an amazing 256 colours. Surprisingly, this doesn't seem to slow Workbench down one bit – if anything, a 256 colour Workbench 3.0 appears to be actually *faster* than a 4-colour Workbench 2.0. Once again, we've got the A1200's 32-bit design to thank for this.

A number of extra Preferences options have also been added. The Workbench Palette requester has now changed into a very Mac-like colour wheel which gives you a far easier method of picking the colour that you want. The Workbench Pattern program has also been extended, allowing you to use an image with up to 256 colours as a background for both the Workbench and windows.

Another very major new feature of Workbench 3.0 is *Locale*, a system which Commodore hopes will make the Amiga the first truly International computer system. Locale makes the Amiga a truly multilingual computer by allowing the user to select the language that they wish to appear in all of Workbench's various gadgets and requesters. There's an absolutely huge choice on offer including some that frankly I haven't even heard of. For users in those countries though, this feature will prove to be invaluable.

SHOULD YOU BUY ONE?

Well, the performance figures that we obtained are certainly a real eye-opener. One thing's for sure – the basic Amiga A1200 clearly doesn't deliver the five fold speed increase that Commodore claim – approximately three-fold is perhaps a more realistic figure. This is especially true when the machine is applied to real world applications.

However, it's important to realise that several factors can effect the speed of the machine. For starters, you'll never get the A1200 to run at its full capacity unless you fit fast RAM to the machine. If the machine is equipped with nothing more than chip RAM, the processor suffers terribly from what the techies call 'cycle stealing' – that is, the custom chips stop the processor from running at its full potential. Fast RAM would definitely cure this.

Those new screen modes eat up a lot of RAM too – both the new 256 colour and HAM-8 screen modes use 8 bitplanes to display a single image, which all adds up to a lot of RAM – for example, a 1280 by 512 pixel HAM-8 image would eat up a massive 655k of chip memory. There's no doubting that the A1200 is a great machine – its graphics capabilities undoubtedly blow away Atari's Falcon! But all that power comes at a price – if you want to use the A1200 for serious applications, you're going to need a lot more than just the basic 2Mb of chip RAM.

Don't let this put you off though – for price versus performance, the A1200 is still the most amazing Amiga since the A500. So is it worth spending the extra £100 above the price of the A600 for the A1200? Well, put it this way – if someone offered you a new Lamborghini for £1000 more than a Ford Escort, which would you choose? To quote Commodore, the Amiga A1200 truly is the machine to aspire to.

RAY TRACING – THE TOUGHEST TEST OF ALL?

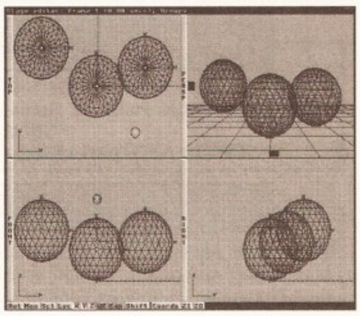
The Amiga 1200's faster processor and 32-bit design should certainly come into their own when applied to heavily math-intensive applications such as ray tracing and solid modelling. We constructed and then rendered a scene on both the A500 and the A1200 using Digital Multimedia's *Imagine 2* ray-tracing program. Here's how they fared:

● **Modelling.** *Imagine's* tri-view editor certainly benefits from the A1200's faster processor. Thanks to the machine's true 32-bit architecture, screen redraw is considerably faster than the A500. Whereas complex scenes often seem to take minutes to redraw in *Imagine's* perspective view, the 1200 leaves the A500 standing. Running on an A1200, *Imagine 2* is transformed totally from a rather slow dog of a program to a really quite usable system.

● **Rendering.** Considering that Commodore are claiming that the new machine runs five times faster than an A500, it came as bit of a surprise that the A1200 only managed to render the scene just over two-and-a-half times faster than the A500. Ray tracing is perhaps the one application that will truly highlight the performance of a processor, so Commodore's claimed 500% speed increase failed to materialise (Figure 6).

Fitting the 1200 with a relatively inexpensive 68881 FPU maths co- processor could quite easily increase system throughput considerably providing that the software that you're running supports this option. Most solid modelling and ray tracing programs come in both integer (processor-based) and floating point (FPU-based) versions, so the addition of a floating point processor would be a good idea. Another factor that could well effect the rendering time of the 1200 is RAM. Our review machine was equipped with just 2Mb of chip RAM, so the absence of fast RAM was bound to slow the machine down.

● **Display.** According to the developers of both *Imagine 2* and *Real 3D*, plans are already afoot to produce upgraded versions of both programs which will allow the displaying of rendered scenes in the new double-A chip set screen modes. Currently though, you'll need an Image processing program such as *Art Department Pro* for EA's new *DPaint-AA* to display 24-bit images in 256 colour of HAM-8 screen modes.



Heavily math-intensive applications such as *Imagine 2* benefit from the 1200's faster processor

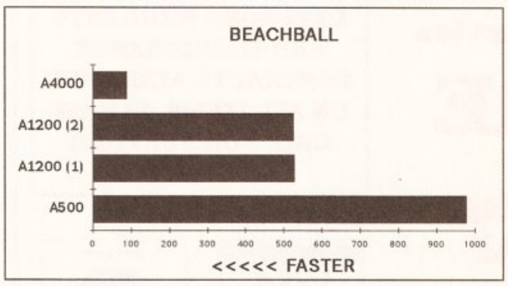


Figure 4: The last of the AIB benchmark results

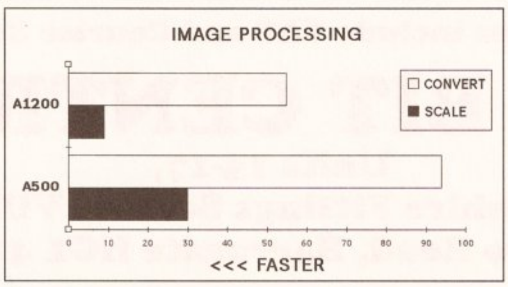


Figure 5: Image processing with *Art Department Pro*

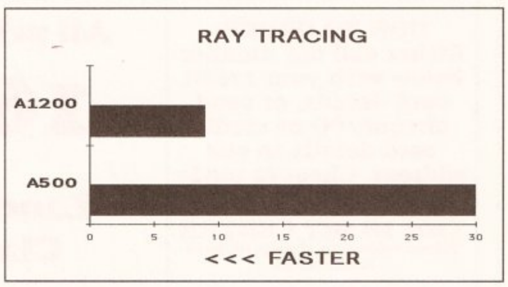


Figure 6: Ray tracing (figures in seconds)

CONTENTS AT-A-GLANCE

OUR EXPERTS TACKLE YOUR REAL-LIFE PROBLEMS

AMIGA ANSWERS



LOCATION: Future Entertainment Show, London, Nov 7th 1992
SUBJECT: Amiga Answers Panel Live
QUESTION: 'Which Fish Disk does Parnet appear on?'
ANSWER: 'No problem...Disk 400'
CONCLUSION: No problem's too tough for these guys...

SO WHAT DO ALL THOSE ICONS MEAN?

Beginners: this icon will appear next to any questions which are 'basic' in content.

General: this icon is used for any general Amiga-related queries.

Caution: be sure that you fully understand the answer before trying it out.

Danger: the answer to this question could well invalidate your warranty – or you!

Hardware: this icon is used to denote questions relating to general hardware.

Buying advice: we use this icon if the question asks us for buying advice.

Printers: this icon denotes a query about printers, printer drivers and so on.

Technical: any queries about programming will have this icon next to them.

Video: this icon relates to any query about using your Amiga with video hardware.

Music: this icon is for questions about MIDI, sampling, synthesizers and so on.

Programs: any program-specific queries have this icon next to them.

Comms: if your question relates to comms, this is the icon that we'll use.

WHATEVER YOUR PROBLEM WITH THE AMIGA, WE ARE HERE TO SOLVE IT

That's the task we have set ourselves in giving you the best possible support for your Amiga. We are confident that our experts can cope with any technical questions you can throw at them. If they don't already know the answer to your problem, they will find it out for you.

We are prepared to deal with any problem you have with the Amiga, from general enquiries about AmigaDOS or Workbench, through questions about specific pieces of software and hardware, to advice on what you need to buy to do a particular task. If it's to do with the Amiga, we will help out. What we cannot do is offer this service over the telephone – do not phone us with your enquiries, but write to us at the address below.

We also cannot enter into personal correspondence – all enquiries will be dealt with in the pages of the magazine. This does mean a bit of a delay in solving your problem, but you'll just have to be a little patient and wait for it to appear in print. You won't get a personal reply even if you enclose an SAE with your letter, so please don't bother.

Send your question on the form below to: Amiga Answers, *Amiga Shopper*, Beauford Court, 30 Monmouth Street, Bath BA1 2BW.

The Amiga Answers panel consists of our consultant editors Mark Smiddy and Jeff Walker – and, of course, our resident deputy editor Cliff Ramshaw. We will also be calling on the services of all our other contributors, so you won't be able to catch us napping – whatever the subject of your query.

Each panellist will be dealing with queries in their own specialist area(s) so it would help us greatly if, when writing, you label your query envelope with the name of the expert who can solve your particular problem.

Below is a list of areas of expertise. It's a list that we will add to and update every month, so you will know who to write to about any subjects not mentioned here.

Gary Whiteley –	**Video**
Paul Overaa –	**Programming, music**
Toby Simpson –	**Programming, hardware**
Jeff Walker –	**Desktop publishing, programming**
Mark Smiddy –	**AmigaDOS, business, CDTV, hardware projects, hard and floppy disk drives**
Jason Holborn –	**Public Domain, AMOS**
Jolyon Ralph –	**Programming, hardware, CDTV**
Cliff Ramshaw –	**All the other bits and pieces**

If you send in a question for the Amiga Answers experts, please fill in and include the form below (or a photocopy if you don't want to cut up your magazine). And please also make sure that you include all the relevant details – version numbers of software and so on – so that we have the best chance of helping you. Send your form and question to: Amiga Answers, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Sorry, but we cannot personally reply to any questions – even if you include an SAE.

Name: ______________________

Address: ______________________

____

____

Your machine:

A500 ☐ **A500 Plus** ☐ **A600** ☐ **A1000** ☐ **A1200** ☐
A1500 ☐ **A2000** ☐ **A3000** ☐ **A4000** ☐

Approximate age of machine: __________

Kickstart version (displayed at the 'insert Workbench' prompt)

1.2 ☐ **1.3** ☐ **2.x** ☐

Workbench revision (written on the Workbench disk)

1.2 ☐ **1.3** ☐ **1.3.2** ☐ **2.x** ☐ **3.0** ☐

PCB revision (if known). Do not take your machine apart just to look for this! __________

Total memory fitted (see AVAIL in Shell for 1.3 Workbench) ______

Chip memory available (see AVAIL in Shell) __________

Agnus chip (if known) __________

Extra drive #1 (3.5"/5.25") as DF__: Manufacturer __________

Extra drive #2 (3.5"/5.25") as DF__: Manufacturer __________

Hard disk: ____Mb as DH__: Manufacturer __________

Extra RAM fitted – type, size in Mb and manufacturer __________

Details of any other hardware which could help us to answer your question:

____

____

____

____

Now, use this space to describe your problem, including as much relevant information as possible. Please continue on a separate sheet if necessary.

____

AS 21

NO PROBLEM!

Welcome once more to *Amiga Answers,* the section of the magazine where we endeavour to straighten out your hassles with that wonderful but occasionally stubborn machine, the Amiga. Every month we devote more space and apply more resources than any other Amiga magazine to solving your problems. We receive something like 100 queries a week, so the service is obviously appreciated.

It's my job to co-ordinate the whole thing: sorting through the questions and sending them off to the relevant chappies for the kind of in-depth answers you've come to expect; and compiling them into the lovingly crafted pages which you see before you.

I call on a variety of expertise to make sure you get the answers you need, which is why *Amiga Answers* is so successful. There's Mark Smiddy, industry guru, AmigaDOS-tamer and business applications wizard; Jeff Walker, probably the most knowledgeable Amiga desktop publisher there is; and Jason Holborn, long-time AMOS explorer and PD sampler, as well as good all-rounder (or should that be all round good guy?); and Toby Simpson, lead programmer for Millennium and accelerator expert.

If it's a question about video, I'll pass it on to Gary Whiteley, our professional videographer for whom the word 'genlock' means 'mixing Amiga graphics with video for magical results' and for whom the word 'snipwirral' means nothing.

Programming queries are dealt with by Paul Overaa, who's not afraid to code in any language, and who doubles as a MIDI maestro to solve your sequencing slip-ups.

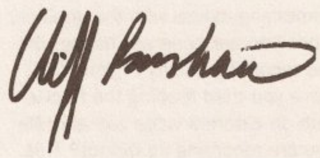
Our hardware guru is Jolyon Ralph. This man knows just about everything about disks, both hard and floppy, and what he doesn't know about memory he's probably forgotten. Communication breakdowns are fixed-up by Phil Harris.

All in all, a formidable team, supplemented by my own not inconsiderable Amiga suss. Let's face it, if we can't answer your question, it's probably one of the Mysteries of the Universe.

Starting soon will be a new section – The Code Clinic – in which Toby Simpson will endeavour to iron out those annoying bugs in your programs. Send your problem programs to the normal Amiga Answers address, marking the envelope 'The Code Clinic' and he'll sort it out.

Don't forget to keep sending us those problems – we love them!

Cheers,



C QUESTIONS

a) How do I get window output in a certain window using C (like in Basic where you have commands like WINDOW OUTPUT 1)?
b) How do I load a module/song and play it?
c) How would I use the AllocMem() function in order to allocate Image data memory?

Mohmud Ahmad
Thorton Heath

You've asked loads of things in addition to the above points and, as a general warning to others (because many of you are now asking dozens of questions in each letter), I'm afraid that two or three query answers per letter is now going to be the maximum (after all, it isn't fair on everyone else if one person hogs all the space for a dozen questions at a time).

a) Each window will have its own rastport and pointers to these are specified in most graphics/text drawing operations. To identify each rastport just look into the window structures and extract the values – then whenever you do a graphics operation just make sure you use the appropriate pointer.

b) With most tracker players you'd kick off the player program as a separate AmigaDOS process using the 'run' command. The *OctaMED* player would be started using:

```
run octamedplayer songname
```

(adding of course any device:filepath info that is needed to specify the locations of the player and song file.)

c) Image data needs to be placed in Chip memory so you must use the MEMF-CHIP flag as in the following example:

```
image_data_p=AllocMem(size,
MEMF_CHIP);
```

PAO

POUNDS FOR DOLLARS

I have installed *KindWords 2* on my hard drive as per the instruction manual, but quite a few keys do not behave as they are supposed to. I get a $ instead of a £ for example. Why?

Also, when I print my documents I can't get bold or underline to work with my Star LC24-200. Why is this?

Mrs K Metcalfe
Basingstoke

Your machine is currently using a US keymap, but you have a British keyboard. You need to tell the computer to use the GB keymap. So open a Shell or CLI window and type:

```
ed s:startup-sequence
```

Go to the bottom of that file and, just above the EndCLI command at the end, add a line that reads:

```
sys:system/setmap gb
```

Save, Quit, and re-boot the machine. Now when you run *KindWords* the £ will be on the £ key and the $ will be on the $ key, and everything else will be where it should be.

Your LC24-200 won't do bold or underline probably because you are using the wrong printer driver. You should be using EpsonQ, and bold and underline should work perfectly well. There's a better driver for the LC24-200 called Star24Plus. You can get the latest version from JAM ☎ 0895 274449. I don't know how well it will work with *KindWords 2* though. I recommend you buy yourself a better word processor. **JW**

ROMBO TROUBLE

I have recently purchased a Rombo Vidi-Amiga Complete Colour Solution and am experiencing some problems when using it with my parallel port sharer and Amiga 500.

When grabbing frames most are distorted in some way although a clean image occasionally appears. When the Vidi-Amiga is connected directly to the Amiga's parallel port the image is fine. Do I need to feed the Vidi more power in addition to its own external power source? Or is something else the problem?

My other problem concerns my RocGen Plus genlock. It was fine when I first bought it. Since then I have changed my video source to a Goodmans GVR-4000. When trying to record an image from the genlock to tape it is unstable and often only appears in black and white. Is the genlock not giving a stable enough signal for this video to use or is my video useless? When connecting the video output from the TV modulator to the video the image is fine.

Jonathan Bond
Cobham
Surrey

The solution to your Vidi-Amiga problem is obviously connected to the parallel port sharer you are

JARGON BUSTING • JARGON BUSTING

Allocmem – a function in the Exec library. When called, it returns a pointer to an area of memory of a size specified by the function's parameter. This is useful for creating temporary space for data while a program is running, especially if the size of this space is unknown when the program is written.

C – a compiled language designed primarily for systems programming. It was used to write much of the Amiga's operating system, and is used in the writing of many Amiga applications.

Digitiser – a device which takes the analogue information taken by a source such as a video camera and converts it to digital screen information for use by a computer.

Keymap – one of several files that are used by the Amiga to translate key presses to the relevant characters for a given country, since different countries have different layouts for their keyboards.

using, as the Vidi works fine when it isn't connected to the switch box. I've tried a Vidi-12 on my A2000 and used a data sharer supplied by Rombo without problems, but judging by the number of you having this trouble all is not well.

Strictly speaking, it is better not to use a data sharer at all (as you have discovered) because the rapid data flow from the digitiser to the Amiga can be disturbed by unshielded wiring, over-long cables or other associated problems. So for the time being, whilst I know it is inconvenient for many of you, the obvious answer is to complain to the supplier of the data sharer and put up with manually connecting your printer or digitiser (after switching the power OFF!).

Regarding the RocGen Plus problem it appears that there is something askew with the genlock, since you are generally happy with the recording quality of your VCR. Have you tried feeding the RocGen with an external video signal while you are recording its output? This may have a bearing on the signal quality. Also, have you looked at the genlock's video output on a monitor to see if anything odd is happening? Beyond that, and advising you to contact the supplier of the RocGen if the problems continue, I'm afraid I can't be of much more help. ***GW***

BITS OF MAPS

I have been using *Lattice/SAS C* now on my A500/A590 combination for some months, and can now use intuition fairly well, but I have a few questions relating to super-bitmap windows and screens.

a) Can I use a paint program, *Deluxe Paint* for example, to create graphics for backdrops, sprites etc. If so, do I need to convert them in any way and what with?

b) How can I initialise a memory area and get my screen or window (or both) to look at that area?

c) How can I persuade a program to load picture data into that area from disk?

I have a good selection of 'C' books, but none of them seem to cover this point.

Rob Edwards
Worksop
Notts

a) Yes you can. The problem arises when you try and actually use this data. *DPaint* saves its brushes and pictures in the IFF file format. To use this, you will need to learn how to use IFF. IFF uses a crude, but usually effective form of compression called 'Byte Run 1'. Simply, Byte Run 1 compresses repeated runs of bytes into smaller chunks. For example, a black line would compress nicely into two bytes. This falls over on complex pictures which have no large areas of continuous colour. Decoding IFF, fortunately, is rather easier to program than writing an encoder. IFF information can be found in the Amiga Autodocs, second and third edition. Bitmap windows require decoded image data: a Bitmap. You could, in theory, use some PD program such as *Deluxelff* which convert IFF to Bitmap files for you, but this is not as preferable as actually doing the conversion in your own program.

b) You will need to allocate a bitmap. Roughly, you would first create your BitMap structure using InitBitMap:

```
struct BitMap my_bit_map;
InitBitMap(&my_bit_map,
depth, width, height);
```

and then link it into your program. You really need to buy the Libraries reference manual third edition, as it is invaluable for information about this sort of thing.

c) It's best to allocate some memory, load in an iff image, decrunch it to a pre-allocated bitmap memory area.

Don't try and be clever and take short-cuts with this sort of thing – make sure you're within the programming rules. Some of the new features on Workbench 3 are causing some people's programs to fall over because they did not go correctly though the operating system. One of these worth mentioning here is the Interleaved Bitmap feature. ***TS***

WHICH HARD DRIVE?

I was considering buying a GVP hard drive (52Mb) for my A500. However, after doing my sums, I figured it would be cheaper to sell my A500 and buy an A600HD (I would get the benefits of WB2 as well), but I feel 20Mb would be a bit too small, so would I be able to put another hard drive in the expansion slot on the side? Apparently, I could buy a PC hard drive and bung it straight onto the Amiga 600. Is this true? Also I have seen 1Mb upgrades for the A600 at £50. Do these fit in the trapdoor expansion slot or does the case have to be opened to fit them? My other alternative is to wait for the 'A800' but I can't decide until I know how much it will cost. Do you have any idea?

Sam Smith
Alconbury
Cambs

I agree the 20Mb drive in the A600HD is a bit pathetic really. I've got some animations on my hard drive that are over 20Mb long each! In the US the A600HD is sold with a 40Mb internal drive, a little better (but remember US machines won't work in the UK without a new Power supply and modulator). You can't add another hard drive onto the side of the Amiga 600 yet. While there are some PCMCIA hard drives in development that will plug into the slide slot, these will be both expensive and may not work on the Amiga without special software. You could buy the plain Amiga 600 and add your own hard drive (any 2.5" AT-IDE hard drive should work, although you'll need cables, mounting screws and hard disk installation software, not to mention automatically voiding your on-site warranty). It's tricky so I wouldn't recommend it.

The A600 1Mb RAM upgrades do indeed fit into the trapdoor without voiding your warranty. It would appear your best options are to either upgrade your 500, buy a 600HD and put up with 20Mb of storage (you *can* upgrade this later, but again you void your warranty), or wait for Commodore to launch some new machines.

I know very little about what Commodore are planning for low-end machines and without knowing what specifications the machine will have it's impossible to guess a price, although as the Amiga 3000 is now only £1500 it would have to be between £500 and £1000, depending on what it contains. ***JR***

MIND YOUR LANGUAGE

I would like to learn to program my computer. I have bought a book called AmigaBASIC by Paul Fellows, but I've found that I cannot use AmigaBASIC on my machine as it stands. What can I do? I want to write games but have found AmigaBASIC totally unsuitable. Which language would you recommend? I have seen several ads for AMOS BASIC and the AMOS Compiler. Do I need to buy the compiler in order to run AMOS BASIC programs?

David Brew, Crosby, Isle of Man

AmigaBASIC is totally unsuitable for programming anything other than very simple utilities, simply because of its slow execution speed. Assembler is definitely the best choice for games programming, but it's a rather tricky language to master. Learning the assembler command set is only half the story – to be able to write high speed arcade games, you will also need a very thorough understanding of the Amiga's custom hardware, its registers and how they are used to produce onscreen effects.

If assembler language doesn't sound like your cup of tea, then a much better bet is Europress AMOS BASIC. As a regular reader of *Amiga Shopper*, you may have noticed that we dedicate four pages to this very impressive language every month. AMOS is ideal for games programming simply because it not only runs very fast, but its command set (over 700!) is geared specifically towards the task of writing high speed arcade games. The latest version of AMOS, *AMOS Professional*, comes complete with a runtime system which allows you to freely distribute your AMOS programs without infringing the copyright owned by Europress themselves.

For added speed though, the AMOS Compiler is worth buying too – however, you should note that the current release of the compiler is not completely compatible with AMOS Pro, although it will happily compile standard AMOS programs without question. Europress claim that a new AMOS Pro Compiler will be available some time in February. ***JH***

JARGON BUSTING • JARGON BUSTING

Basic – Beginners' All-purpose Symbolic Instruction Code is a high-level programming language, much favoured by micro-computer users. It combines a fair amount of power with ease-of-use.

Bitplane/bitmap – an area of memory where every binary bit corresponds to a pixel on the screen. One bitplane represents a monochrome image, several can be overlayed (a bitmap) to represent a colour image.

Hard drive – like a floppy drive, but much bigger and faster. Also, the disk cannot be removed, so once the hard drive has been filled, it's either time to delete excess files or get another one.

Intuition – the part of the Amiga's operating system concerned with window handling, menus and so forth. It interprets user input from the mouse and sends information to the relevant windows via the Intuition Direct Communication Message Ports.

PHOENIX

A1200 NEW — AMIGA 1200

Probably the home computer of the decade, the A1200 is the latest addition to the Amiga family. Incorporating a new internal engine and many more exciting and powerful features, this machine truly takes the Amiga family into the next generation!!!!!!!!!

FEATURES INCLUDE:

68020 Processor Running at 14 Mhz • 2Mb Chip RAM (expandable to 10 Mb using 4Mb fast memory PC MCIA cards and 4 Mb 32-bit RAM in CPU slot) • New double "AA" graphics chip set • 256 colours on screen from a 16.8 million colour palette • Full Amiga Key board (with Alpha numeric key pad) • CPU local BUS slot, (card edge).

Phoenix Price Only £379.99

A 600 NEW PACKS

'THE WILD, THE WEIRD & THE WICKED'

1 Mb A 600 as standard and includes the excellent value Software titles: Deluxe Paint III • Formula One Grand Prix • Putty • Pushover

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A 600 2Mb *(incl. above software)*.........**£379.99**

'EPIC•LANGUAGE PACK'

1 Mb A 600 as standard and includes **20MB HARD DRIVE** the excellent value Software titles: Deluxe Paint III • Trivial Pursuit • Epic • Myth • Rome

Phoenix Price Only......... £484.99!

A 600 2Mb+20 Mb Hard Drive £524.99

(both include the above detailed software)



The stand-alone A 600 is compact, semi portable, fully featured and can be purchased in the following configurations:

A 600 ....£274.99
A 600 HD ..... NOW ONLY £429.99
A 600 2Mb £314.99
A 600 HD 2Mb £469.99

A 600 RAM EXPANSION

Phoenix PA 601-populated-1Mb.....£44.99
Phoenix PA 601-unpopulated-0Mb...£24.99
Phoenix A 600 ROM Sharer...........£29.99
Keyboard switchable!

A 4000 AMIGA 4000

Features Include: 68040 32 Bit Processor running at 25 MHz (upgradable) • New Double AA chipset with 16.8 million colours • high density 1.44 Mb floppy • 120 Nb IDE hard drive • New Workbench 3

AMIGA 4000.................. £2,229.00
A 4000 with 40/240/425 Mb Hard Drive.......£POA

1500 AMIGA 1500

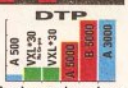
2.04 Workbench Includes: Deluxe Paint 3, Platinum Works, Home Accounts, Toki, Puzznic, x Elf, Amiga Format Book and Joystick

AMIGA 1500............... ONLY £539.99

A 500 EMULATORS

GVP PC-286 16MHz.........................£239.99
KCS Powerboard (with DOS 4.01)........**£199.99**
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KCS adaptor for 1500/2000.... ONLY £59.99
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B5000 + 4MB 25.00 Mhz **£979.99**

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Series II 120 Mb Hard Disk and RAM card...£399.99
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A 500 ACCELERATORS

GVP Combination Accelerators & Hard Drives-The ultimate expansion product for the Amiga 500!

A530 Combi 40MHz + 52Mb Hard Drive.......£659.99
A530 Combi 40MHz + 120Mb Hard Drive....£757.99
A530 Combi 40MHz + 240Mb Hard Drive.....£979.99
A530 68882 Co-Processor.........................£204.99

FAST ACCELERATORS 1500/2000

GVP G-Force 030-25MHz + 1Mb................£545.99
GVP G-Force 030-40MHz + 4Mb................£784.99
GVP G-Force 030-50MHz + 4Mb...............£1099.99

FAST ACCELERATOR RAM Modules

1Mb Simm-32 Bit 60 Nanoseconds.........£65.99
4Mb Simm-32 Bit 60 Nanoseconds.........£182.99

PC EMULATORS 1500/2000-3000/3000T

Vortex 'GOLDEN GATE' NEW! £419.99

This emulator is the ultimate bridge between PC/AT platforms and the Amiga. If you think this is for you, cross to page three for specification details in this months 'Trail Blazers' section!

IMAGE PRINTERS

STAR

LC-100 Colour.................. NEW! £159.99
9 PIN colour printer with paper parking, eight fonts and electronic DIP switches.

LC24-100 .... NEW! £189.99
24 PIN with compressed data mode, 16 K buffer and 10 letter quality fonts,(with Star printer driver only).

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LC-200 Colour.....................................£195.99
LC24-20..£199.99
LC24-200 Mono £219.99
LC24-200 Colour.................................£268.99
XB24-200 Colour.................................£379.99
SJ48 Bubblejet .... NOW ONLY £219.99
Star printers come with one year warranty.

CITIZEN

Swift 240 Colour............... NEW! £279.99
Swift 240 Mono................. NEW! £259.99
Swift 200 Colour............... NEW! £219.99
Swift 200 Mono................. NEW! £199.99
Swift 9 Colour........ SPECIAL OFFER £179.99
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Deskjet-550C *(colour printer)*.... **NEW! £559.99**
300 dpi laser quality output • sharp blacks and 16 million colours available • six built in type faces-4 scalable • improved media handling • several paper sizes • **FOUR TIMES FASTER** than previous H.P. Deskjet range.

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HP black ink cartridge £24.99
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STAR LC24-200......................................£62.99
STAR LC24-20..£62.99
STAR SJ48...£49.99

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Upgraded version of BJ10e, the worlds biggest selling portable inkjet printer.

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CANON BJ 330................... NEW! £499.99
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CANON Bubblejet cartridges...........£17.99

PHOENIX PRINTER PACK
Supplied with **ALL** printers containing 1.8m std. printer cable, printer ribbons/cartridge and 250 sheets of paper absolutely **FREE.**

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We have a large range of **high quality** printer accessories for all the printers we sell including: **dust covers from £2.99 • Ink cartridges from £13.99 • Mono ribbons from £3.50 • Colour ribbons from £7.99 • Printer stands from £7.99**

SILICON CHIPS

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Kickstart 2.04 ROM	£34.99		
Kickstart 1.3 ROM	£27.99	Fatter Agnus 8372A	£34.99
NEW Super Denise	£29.99	CIA 8520A	£9.99

MEMORY CHIPS

4 Mb x 9 (-70) Simm	£99.99	1 Mb x 4 (-80) Zip	*£34.99
1 Mb x 9 (-80) Simm	£27.99	256k x 4 (-80) Zip	*£29.99
256k x 9 (-80) Simm	£22.99	1 Mb x 1 DRAM	£3.49
256k x 4 DRAM	£3.49	*This price is for 1 Mb of RAM	

These chips cover practically every popular memory expansion or Hard Drive system on the market for the Amiga ie. GVP, SUPRA, MICROBOTICS, COMMODORE

"I must write to congratulate you on the efficiency of your mail order staff."
Robert S. Blair ~ Denmark

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SUPRA 500RX the ultimate in Fast Ram expansion units. *(*Uses 256x4 Zips)*

8 Mb pop to 1 Mb*.......................................£99.99
8 Mb pop to 2 Mb*.....................................£124.99
8 Mb pop to 2 Mb.......................................£149.99
8 Mb pop to 4 Mb.......................................£209.99
8 Mb pop to 8 Mb £309.99

VISION MONITORS

PHILIPS 8833Mk II........ ONLY £194.9
Colour Stereo Monitor now including **'Lotus Turb Challenge'**, and 1 years on-site warranty.

COMMODORE 1085 SDI £216.9
COMMODORE 1084 SDI..........£199.9

All monitors are supplied with a FREE cable for connection to your Amiga.

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Don't confuse these quality disks with other currently available. 3.5" 100% certified error free 70 clip. All disks include **FREE** high quality Phoenix label

10	£4.99	200	£72.9
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TDK Branded disks- High performanc media from the experts-box 10 with labels.

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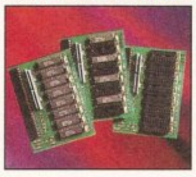
Midi-Midi 2m	£3.99	Modulator ext	£9.9
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Midi-Midi 5m	£5.99	Amiga-8833MkII	£9.9
Disk Drive ext	£9.99	Joystick long ext	£4.9

Mouse/Joystick ext..£4.9
Mouse/Joystick splitter...................................£4.9
***Serial/Modem cables.....................................£9.9**
***Amiga-Multisync.................................from£9.9**
***Amiga-Microvitec..£9.9**
***Amiga-CPC monitor......................................£9.9**
***Amiga-RGB/TV...£9.9**
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***For full details of these cables o information regarding the right cable fo the job call 0532-311684. Custom built lead are no problem Phoenix.**

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A PHOENIX RAM module can expan your chip RAM up t 2 Mb by using th trapdoor expansio port. Extra RAM i necessary to unleash th incredible graphics capa bilities of your Amiga. All our boards carry a full 2 year n quibble replacement guarantee. **It's never bee cheaper to upgrade!**

1 Mb Fully populated RAM board.... NOW ONLY £34.9
1 Mb unpopulated RAM board.........£16.9

VIDEO MULTI-MEDIA

Rombo's Vidi Amiga 12 is the replacement for thei complete colour solution bringing you the world' first mass market colour digitiser for **under £100.**

VIDI-AMIGA 12 .... ONLY £79.9
Outstanding features and plenty of **VFM!**-*(Valu for money!)*-Highly Recommended.

ROCGEN Plus £129.9
Quality features and performance-Recommended.

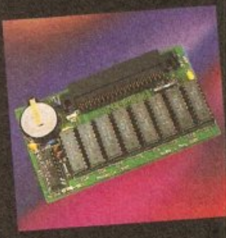
ROCKEY BY ROCTEC
The new chroma key unit - used in conjunction wit a Genlock - allows you to superimpose live vide over graphics or video-substitute the brightnes portion of a video source with a keyed image Embed live video in graphics!

Phoenix Price.......................£269.9

TRAIL BLAZERS-WHAT'S NEW IN NOVEMBER 1992!

In this month's pre-christmas "TRAIL BLAZERS," we focus on some of the best products and peripherals currently on release for the Amiga.

PHOENIX 1Mb A600 UPGRADE



Simply the Best !

...£44.99

ROCTEC ROCLITE

This famous super slim drive has now been upgraded to include Anti-click and virus checker - We have reluctantly had to raise the price of this product due to the variance of the dollar rate. However to soften the blow we will include a FREE disk head cleaner worth £3.99

Phoenix price..........£64.99

FINAL COPY-UK VERSION

This powerful, unique WYSIWYG word processing package is the best value choice for your Amiga, sharing many of the features of full-blown DTP packages

Phoenix price.........£69.99

Be safe in the knowledge that you are buying the official UK version of the product from Phoenix. *BEWARE of dealers offering "Latest version" of Final Copy. This may be American product and should not be sold in the UK!*

VORTEX 'GOLDEN GATE'

Designed for the Amiga 1500/2000/3000 and 3000T this is a 25MHz 80386SX PC/AT Emulator. PC/AT slot support-Max 16 Mb PC/RAM, 4Mb for Amiga-Will use PC/AT IDE Hard Disk and floppy disk drives 2.88 Mb under Amiga DOS, highly recommended.

Phoenix price.........£419.99

AMOS PROFESSIONAL

The most eagerly awaited software package of the year, has just received an award of 97% in CU AMIGA. Francois Lionet's superb creation has now evolved to include numerous new features developed from Amiga users ideas and feedback. Don't miss this six disk Bonanza!

Phoenix price £44.99

OPAL VISION

Amazing new 24-Bit graphics card and video system for the Amiga 1500, 2000 and 3000. Includes software suite worth hundreds of pound. With an incredible performance, this is simply awesome.

Phoenix price.......£739.99

PHOENIX PRODUCTS

Mouse/Joystick Switch..................£13.99
Don't damage your Amiga's ports! This device saves wear and tear makes switchover ***FAST,*** and does **NOT** require power unlike many others.

Computer/Video Scart Switch....£19.99
Flip between Video/computer signals at the push of a button.

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Superb sound and excellent dynamics. These two-way stereo Hi-Fi speakers are an Amiga standard- **Excellent companions on any gaming soiree!**

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Phoenix Deluxe Drive.....................£47.99
Roctec Roclite..................... NEW! £64.99
This famous drive has now been upgraded to include Anticlick and Virus Checker
Disk head cleaner..........................£3.99

FREE FAST UK DELIVERY

NEXT-DAY COURIER ONLY £4.50

MUSIC - AMIGA MUSIC

Attention all you music lovers! Phoenix have kept this unbeatable music deal running for you throughout the Christmas period.

MUSIC-X Jnr....only £15.00
When purchasing either a Phoenix Stereo Sampler or Pro Midi 2 Interface
Please Note: this is a limited offer only while stocks last!

Stereo Sampler......... NOW ONLY £29.99
Combines ease of use with state of the art analogue to digital conversion technology.(inc. **FREE** sample editing software +audio lead)

Pro-Midi 2 Interface......................£24.99
This fully featured professional quality midi interface is very flexible giving semi-patch bay facilities. It has five ports in, out, thru and two switchable out/thru. (inc. **FREE** midi lead)

GVP Digital Sound Studio...........£54.99
High quality sound sampler for all Amiga Computers
Amiga Music Made Easy-Only from Phoenix!

A 570 CD ROM

This essential add-on has finally arrived, suitable for A500/A500+, A570.

Phoenix price... ONLY £329.99

MICE & TRACKBALLS

NAKSHA Upgrade Mouse.............£24.99
(With Operation Stealth, mat & holder)
Roctec Mouse..................................£13.99

GOLDEN IMAGE
Mega Mouse.................................£12.99
(Has just received 90% Amiga Format Gold Award)
Optical Mouse..............................£29.99
High precision, pointing device.
Crystal Trackball...........................£37.99
Infrared-Cordless-Mouse... NEW! £47.99
(Rechargeable top selling innovation.)

Optical Pen Mouse............. NEW! £39.99
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Powerful image processing tools for the office or the home environment.

POWER-Features include: 100-400 dpi • 64-Greyscales Thruport to printer • **FREE** Editing software.
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Features: 400 dpi • 256-Greyscale • Touch up and Merge it software.
AlfaScan £124.99
AlfaScan Plus £149.99
AlfaScan OCR *(inc OCR Software)*.....**£279.99**

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ASDG-SOFTWARE-Scanning software comes in two forms, integrated into art development as a new module or used as a stand-alone programme.
Phoenix Price.....................£109.99

ACCESSORIES STUFF

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Heavy duty construction,rubber edging, perfect colour match, makes an ideal workstation for the A500/A500+ **A 600 control centre now available.**

DATA SWITCHES-*(25 pin D type)*
2 way...£15.99
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90 Capacity BANX.............................£11.99
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Top grade, heavy duty injection moulded boxes. Low cost, high quality.

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£79.99

The popular upgrade kit for 1.2 / 1.3 owners from Commodore is in stock and selling fast!

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Kindwords 3..£36.99
Final Copy 2 .... NEW! £66.99
Professional Page 3........... NEW! £129.99
Saxon Publisher..................... NEW! £189.99
Pagestream v2.2 ....£126.99
Pagestream Font pack 1 ....£44.99
Pen Pal 1.4.................... SPECIAL OFFER £39.99
Prowrite v3.X £57.99
Quickwrite £36.99
Wordworth £79.99
Hot Links £52.99

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Gold Disc Office £59.99
Mini Office .... NEW! £39.99

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Design Works £53.99
Professional Draw 3 ...... SPECIAL OFFER £79.99
Intro CAD Plus £74.99
X CAD 2000 ....£99.99
X CAD 3000 ....£269.99

UTILITIES

Lattice 'C' v6.......................... NEW! £214.99
A-Talk 3 ....£44.99
Cross Dos v5 *(inc, Cross PC Emulator)*.......**£29.99**
Diskmaster 2 ....£43.99
Dos 2 Dos £29.99
Opus Directory £29.99
Xcopy £36.99
Quarter Back £45.99
Quarter Back Tools Vs 5.........................£49.99

DATABASE

Superbase Pro 4 ....£164.99
Superbase Pers 2 .... NOW ONLY £39.99

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SCALA 500 ....£79.99
SCALA Professional £219.99
Big Alternative Scroller £35.99
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Font Pack 1 for Broadcast Titler 2 ....£88.99
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Deluxe Paint 4 ....£63.99
Deluxe Video 3 ....£71.99
Image Finder £44.99
Pixmate £43.99
Scenery Animator £62.99
Vista £43.99
Pro Vista £71.99

ANIMATION

Take 2 ....£42.99
Image Master £129.99
3-D Images £36.99
Amos £36.99
Amos Professional................. NEW! £44.99
(97% in CU Amiga-Software release of the year)
Amos Compiler £21.99
Amos 3D £25.99
Easy Amos £22.99
Deluxe Paint 4 ....£63.99
Director v2 ....£71.99
Imagine v2....................... NOW ONLY £189.99
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Presentation Master £169.99
Surface Master for Imagine £29.99
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Can Do v1.6 .... NEW! £72.99
Art Department Pro v.1 ....£143.99
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Can Do It V.I.G £94.99
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NORMAL OPENING TIMES: Mon-Sat 9.00am-6.00pm FAX: 0532 319061 E&O.E.

LOOPING THE LOOP



I have a lot of short Amiga Basic programs which consist of endless loops that run until I deliberately stop them. But when changing to other programs I get a 'File already open' error. What instruction can I put at the start of a program to ensure that the previous programs files are closed?

Ron Martin
Burwell
Cambridge

If you interrupt programs that have files open halfway through execution in order to run some other program then you deserve all the problems you've experienced. This really is very bad programming practice. Trying to get a subsequent program to clean up after the first by closing the previous programs' files is another convoluted idea that you ought to forget about completely.

As it happens it is actually quite easy to close all the open files of a running program which has been interrupted: Just type CLOSE in the AmigaBASIC output window. After that all will be well and you will be able to run further programs without getting file related errors. ***PAO***

NOVICE NEEDS HELP



I am a new Amiga owner, having just exchanged my PC for a WB 1.3 A2000 with a 40 MB hard disk and 4Mb RAM. I also have a multi-sync monitor, a 1084S RGB monitor and a RocGen Plus genlock. I would like to know if it is possible to use my 'flicker card' with a video card? Also, will two genlocks allow me to dissolve from one video source to another? And, where can I learn about upgrading ?

AL Woodcock
Horndean
Hants

JARGON BUSTING • JARGON BUSTING

Accelerator board – a device which either includes a central processor like the Amiga's, or a more advanced one in the same range, but operating at a higher speed.

Emulator – a device, either hardware or software, that enables programs written for another machine to be used on the Amiga. The emulator makes the Amiga take on all (or most) of the characteristics of the foreign machine, and is transparent to the programs running under it.

Genlock – a way of slaving one video source (an Amiga) to another (a video tape) in order to synchronise their signals. This allows stable wipes, mixes and other effects including overlay between the two sources.

24-pin – similar to a 9-pin printer, but with a printhead containing 24 pins. The textual output of such a printer is of a higher resolution, and therefore much better quality.

32-bit Memory – normally, memory on the Amiga is 16-bit. This means that when information is received by the processor from RAM, it is done so in chunks of 16 binary digits at a time. 32-bit memory is sent in 32-bit chunks, thus increasing the speed of information transfer.

Welcome to the world of Amiga video, Mr Woodcock. As you've already discovered it's a confusing set of jargon and equipment you're going to be dealing with, but this applies to all computers, not just the Amiga. Now, on with the show.

Since you haven't said what kind of 'flicker card' you have I'm not sure what the answer is, except to say that if it takes up the Video slot of your Amiga then unless you remove it from the slot you won't be able to use any other video cards which also use this slot. If the flicker card is one that fits in a chip socket then the answer may or may not be yes, depending on what video card you are planning on using.

Without getting technical, the short answer is that two genlocks *won't* let you mix from one video source to another. In order to be able to do this, you'll need a proper vision mixer.

As for advice about upgrading the chips and so on, keep reading magazines like *Amiga Shopper*. ***GW***

HIGH QUALITY, LOW PRICE?



I have been asked to recommend a printer for use with the Amiga 500 Plus. I myself am mainly involved with PC and Vax systems, although I have a great respect for the powerful capabilities that the Amiga has to offer and am intending to buy one for use at home.

A friend is already using the 500 Plus and now wants a printer for producing high quality documents as well as graphics. The price limit is around £300.

Kevin A Mills, London SE1

High quality for £300? Well, you can pick a 24-pin dot matrix up for about that, but I wouldn't call 24-pin dot-matrix 'high' quality. Good quality maybe, but not 'high'.

For high quality you need to start at the inkjet or bubble jet level, and the only models that fall into your price range are the monochrome Canon BJ-10ex and BJ-20 (or clones). If you hunt around you might find the monochrome Hewlett-Packard DeskJet 500 going for just over £300. ***JW***

PUTTING YOUR FOOT DOWN



I am very seriously considering purchasing a GVP 530 hard drive/accelerator combo. Having nearly saved enough beads, I was wondering if you could answer a few questions for me?

My setup consists of an Amiga A500 Plus, with 2Mb of chip and 2Mb of fast memory in a Supra 500RX. I also have a Datel Action Replay III cartridge.

I intend on selling my external drive, but I am not sure about the Supra memory expansion. Will the drive sit on the Supra through port, or will there be problems?

What level of compatibility can I expect? Can you foresee any problems I might have with the other equipment I have?

I know the 68030 can address the 16 bit memory, but can the 68000 address the 32 bit memory? If that was so, I would then be able to sell the Supra.

Finally, do you think Commodore have done the right thing, in putting a 14MHz 68020 in the new Amiga. Do you think it is fast enough?

Martin Grundy
Newbury
Bolton

In theory, the Supra should work. In practice, it's not recommended to hang things off your A500 expansion port using through connectors. It's much better to expand the memory slots inside the A530 and sell the Supra. You do have a small catch with regards to using the A530's memory whilst in 68000 mode: you can't. The switch on the top is really only to allow you to run games and so on, as when you disable the turbo, you disable the hard disk and memory also.

One of the other problems you will have is the Action Replay cartridge. You will not be able to use this with the A530 plugged in, as the A530 does not have a through port. This is sensible, as Commodore have always said you should never daisy chain devices off the expansion port. Even if you could plug it in, it wouldn't work as the Action Replay cartridges have compatibility problems with faster CPUs.

With regards to the 14MHz 68020, I think it is excellent. The 68EC020 processor found in the A1200 is extremely cheap. This is what allows them to sell a 2Mb AGA computer for 399 pounds. ***TS***

64 QUESTIONS



Would you be kind enough to advise me regarding Commodore 64 emulators which are available for the Amiga?

a) What hardware or software do I need which will enable me to use a C64 C2N cassette recorder on the Amiga?

b) Do most C64 programs run OK on the Amiga C64 emulators?

c) Can I save the C64 programs onto Amiga floppies once they have been loaded?

d) Can you recommend a good virus checker which will protect a hard drive from infection?

e) Which is the best 'budget' accelerator card for the A500? I have seen several advertisements for faster 68000s such as ICD's ADSpeed and Power Computing's Blizzard Turbo board. I don't really need anything particularly fast, but I'd still like to speed up general system performance, some DTP programs as well as the odd game. What would you recommend?

Anon

a) I'm afraid it's not possible to connect a cassette drive to the Amiga using any of the currently available C64 emulators. Although I've seen several Spectrum emulators which claim to allow cassette loading via a sound sampler, none of the C64 emulators support this. What you will need to do is to borrow a friend's C64 disk drive, transfer all your cassette programs to disk and then connect this to your Amiga. Sorry I couldn't be of more help.

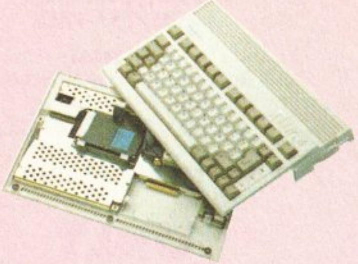
b) Surprisingly, the overall quality of emulation is very good indeed, although there's still a noticeable decrease in speed when faster C64 programs (games and such like) are run under an emulator.

c) Providing that you can load the programs from a C64 disk drive, most of the emulators that I've seen

continued on page 56

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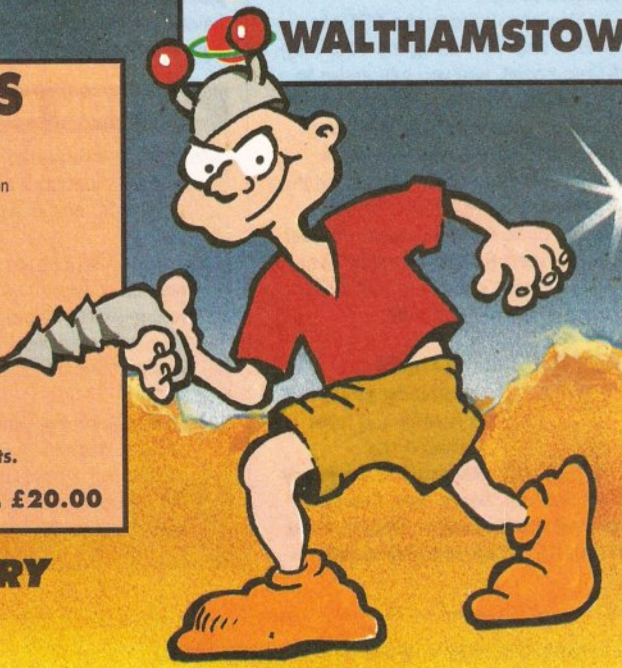
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(both PD and commercial) do allow you to transfer C64 programs on to Amiga floppy disks.

d) I personally recommend Frank Veldthuis' *Virus Checker* program. It can be installed via your drive's startup-sequence and will happily run in the background monitoring any disks that are inserted into your Amiga's drives. I've had *Virus Checker* on my system for several years now and I've never suffered from the dreaded lurgy.

e) To be perfectly honest, I'd recommend you to sell your system and buy yourself a new A1200. It comes as standard with a 68020 with 2Mb of 32-bit chip RAM and provides provision for a separate maths co-processor. Not only that, but it can easily be upgraded to a faster processor for very little cash. Ok, you'll be starting from scratch again (your A500 hard drive won't work on the 1200), but you'll have a considerably better system (not to mention the new AGA chip set!). ***JH***

CDTV CONTACTS

I have bought a CDTV. Can I hook it up to to the Amiga 2000 to take advantage of the Hard Disk and extra memory? Can I increase the CDTV from 1Mb? Can I update CDTV Kickstart to 2.01?

James Robertson
Brechin

You can link the CDTV to your Amiga using the public domain network software *Parnet*. This allows you to link your CDTV and Amiga with a custom parallel cable (which costs around £10 to make) and access the CDTV devices from your Amiga, and vice versa. The *Parnet* software can be found on Fred Fish Disk 400 (All Fred Fish disks are available for CDTV on the CDPD Public Domain CD from Almathera ☎ 081 683 6418 priced £19.95).

You can upgrade the CDTV to 2Mb of chip ram using the DKB Meg-A-Chip board, and you can go up to 6Mb of fast ram (and double the speed of your 68000 at the same time) with the Blizzard expansion board, available soon. Upgrading the Kickstart is more difficult as you require three ROM changes, not just the Kickstart ROM (see my answer to Matthew Laye's letter in this issue for more information). ***JR***

AREXX INSERTION

I'm getting interested in ARexx and have installed the RX_intui.library in my User-Startup. Since then I've been getting the message 'ARexx server not active'. Can you please tell me why because, before insertion of the line 'rxlib rx_intui.library 0 -30 0', everything was OK?

S H Dyhall
Great Yarmouth
Norfolk

The error is definitely telling you that the ARexx resident process has not been started. Check your startup scripts because I suspect that you have inadvertently removed the rexxmast command (which starts up the ARexx resident process) during your startup editing operations. ***PAO***

SATISFYING RESOLUTION



My Star LC24-20 24-pin printer won't print graphics at the highest resolution of 360 by 360 dpi. I've tried the EpsonQ and Nec_Pinwriter drivers, but the only driver that prints graphics at all is the 9-pin EpsonX driver. What am I doing wrong?

Geir Haatveit
Drangedal
Norway

EpsonQ has a highest resolution of 360 by 180 dpi, so that's why that doesn't work properly. The Nec_Pinwriter is Epson compatible and does 360 by 360 dpi, and in theory it should work with the LC24-20 perfectly well provided it is in Epson mode. As ever, you should check your DIP switches.

Your best bet is probably the proper Star24Plus printer driver, available on the Printer Driver disk for £2.95 from JAM, 75 Greatfields Drive, Uxbridge UB8 3QN. ***JW***

MONITOR TROUBLES AGAIN...



I have a second hand Mitsubishi CT-2517TX colour television which has a SCART/Peritel socket which I would like to use to improve my picture quality. At the moment I am having great problems trying to find a compatible lead. I've tried most of the leads available but the only one which seems to work is the Amiga-Sony one.

Unfortunately, when using this lead the picture output is incredibly dark, and the only way of brightening the picture up is to take the back off the TV and adjust the internal contrast control, which then makes normal television viewing too bright.

I have written to Mitsubishi but all I received was a 'return postage' envelope saying that they were no longer at that address. Is there any help you can offer?

Andrew Hawkins
Plympton
Plymouth

Don't panic! Consumer Division at Mitsubishi tell me that this is how to connect up your Amiga RGB to the CT-2517's SCART:

AMIGA		SCART
3	RED	15
4	GREEN	11
5	BLUE	7
10	C SYNC	20
22	+12V	8
23	+5V	16

So, make sure this is how you do it. Alternatively you could contact the usual monitor experts – Meedmore Ltd on ☎ 051 5212202 or Trilogic on ☎ 0274 691115.

Incidentally, Mitsubishi weren't messing you around – they really *have* moved. Their new address is Consumer Division, Mitsubishi Electric UK Ltd, Travellers Lane, Hatfield, Herts AL10 8XH ☎ 0707 276100. ***GW***

TIME ENOUGH FOR ASSEMBLER

I recently bought *DevPac 3* and am now trying to code in Assembler. I am not having much success and so I would like to ask some questions:

a) I am trying to use the DOS function DateStamp to assign the time to a variable. In a C book, this was accomplished with:

```
long time[3];
DateStamp(time);
```

I translated this to:

```
move.l      #raw_time,d1
CALLDOS     DateStamp
move.l      d0,raw_time
raw_time:   ds.b    12
```

It didn't work, could you print some code to do this?

b) I have the RKM Includes and Autodocs and a general 68000 assembler book, but I was wondering what books I should buy to hack into the OS. I have an excellent *Mastering Amiga System* and would like to know if there is a similar book for assembler freaks.

c) Are there any PD disks with assembler examples on them?

d) Also, how can I convert a decimal to a floating point number in order to use the functions in the mathffp.library? I am trying to write a program to display the Mandelbrot set and so using the amiga.lib functions for each loop would be very slow.

Shailesh Patel
Leicester

a) The function DateStamp returns a pointer to the structure it filled. In this case, it returns exactly what you sent it. The returned DateStamp is actually three long words, one for the day, one for minutes and one for ticks. To get a real date out of this – days, months and year – is actually quite complex. It's much better to use the 2.0 DOS functions DateToStr for that. To correct your code, simply remove the move.l d0,raw_time. On return from DateStamp, you can read in the days, for example with something like:

```
include "dos/dos.i"
lea      raw_time,a0
move.l   ds_Days(a0),d0
; Read days in.
move.l   ds_Minute(a0),d1
; And minutes in day.
move.l   ds_Tick(a0),d2
; And ticks in minute.
```

b) The RKM books are perfect, except that they are biased towards C, which is hardly surprising as the Amiga Operating System was written in C. If you're thinking of writing large OS based applications, then assembly language is the wrong choice. C would really be better.

I am not sure what you meant by "hack the OS". There is no book on "hacking" into the operating system. You're better off getting a good book on C, and reading a bit of that so that you are able to convert from C to

JARGON BUSTING • JARGON BUSTING

ARexx – an interpreted programming language that is included as standard with Workbench 2 and above. It is used extensively to control other programs, and is a great aid to multitasking.

Assembler – a program which converts an assembly language program written in words (well, almost) into the machine code numbers that the Amiga's 68000 processor understands. Writing programs in assembly language ensures that the best possible speed and memory efficiency is gained from the machine.

CD-ROM – Compact Disc Read Only Memory is the latest technology in storage devices. A CD can hold over 600Mb of data, compared to around 100Mb for a hard disk and 880K for a floppy disk. The big disadvantage is that users cannot store information on a CD, only retrieve it, but this doesn't stop CD from being a potentially revolutionary medium.

assembler a lot better. You don't actually have to learn C, but a basic understanding will suddenly make the RKMs look a lot more helpful!

c) Phone or ask around. A lot of the public domain utilities written in assembly language come complete with source code.

d) You should not have to do your conversion every loop. Either deal in FFP, or Integer, and convert where absolutely necessary. FFP work using Commodore's maths libraries is far easier for you. Try looking in your library book under mathffp.library, and you'll find they are very "assembly-language programmer friendly". ***TS***

PC COMPATIBILITY



I have had an A500 for 4 years, and have decided I need a bigger machine. I also need PC-AT compatibility for my studies. I have my eye on an A1500 with an A2286 bridgeboard and a 1.2MB 5.25 inch floppy drive. I don't want to spend too much money to start with and I want a system I can gradually expand (with a hard disk, VGA and such). Could you tell me what the best strategy is, or would I be better off with another system?

Justin Baker, Lower Earley, Reading

Good question! I have had a sleepless night over this one. Half of me says, "Buy a PC, it would be better for you in the long run and a lot cheaper if PC compatibility is important" and the other half says "No! Buy another Amiga, they're better." To be perfectly honest with you, if you don't really need the Amiga compatibility but absolutely require a PC with VGA, then it would be much more economical to buy a cheap 286/386 PC with a VGA card and monitor. The newer Amigas, such as the A1200 are far superior to the VGA graphics system, and the Amiga's operating system is much better than Windows. Currently, you cannot emulate the PC on the A1200. The A1500 is getting a bit dated now, and is very slow with just a 7.14MHz 16 bit 68000.

In an ideal world, you'd be able to buy a cheap PC and an Amiga 1200 and sell the A500. That would cost pretty much the same as buying an A1500 with 2286 bridgeboard. ***TS***

AMOS ANSWERS



I am a very keen AMOS user and as such I have a few questions to ask.

a) As I am going to try to write a word processor, it is obvious that I am going to need some printer routines. AMOS only seems to be able to print text and not graphics. I want to include the option to insert IFF pictures into a file so I have to be able to print graphics. Are there any ways of doing this?

b) Is it possible to make my word processor work with printers other than the model which I own (an MPS 1500C)?

c) Is it possible to print different fonts as text so as to avoid printing them as (much slower) graphics?

d) When printing, how many pixels will make up an inch?

e) What is a pica?

f) I also enjoy writing small games. However, when I use more than seven or eight bobs on screen, they start to flicker badly, making them pretty useless for anything other than strategy games. Is there a way of overcoming this problem?

g) Another problem is the speed of the LOCATE and PRINT commands. If I try to use these when an alien is killed to display the updated score, all the other non-AMAL Bobs jerk horribly. Is there a way of displaying the score using a faster technique?

h) Is Add SCORE,10 faster than SCORE=SCORE+10? Alternatively, will the DEEK and DOKE commands work even faster?

i) Would the AMOS Compiler help me with these any of these problems that I have encountered?

j) When I open a hires screen, it is only 640 by 256 pixels in size. Is there a way of displaying a full 640 by 512 pixels on the screen?

k) I also have GFA BASIC 3.5. After a quick glance through the manual, I have noticed that GFA offers a HARDCOPY command which prints graphics. Is this facility available through AMOS?

l) Having programmed in assembler on the Spectrum, I know it is a lot faster than any other language. Could you advise me on which assembler to buy?

James Bosson
Lanzarote
Canary Islands

a) Printer support was rather weak in the original AMOS, but Europress have enhanced it immeasurably within AMOS Professional. As well as direct support for the system Preferences settings, the new release of AMOS provides a selection of brand new printer-related commands that give you far more control over your printer. Europress are offering an upgrade path to existing AMOS users, so I'd advise you to upgrade as soon as possible.

b) Once again, upgrading to AMOS Pro will solve your problem.

c) Solving this problem is a little trickier, simply because of the huge number of different printers on the market. Unless you want to program the printer's character set directly (a very tricky and time consuming task), all you can basically do is to allow your users to 'embed' printer control codes which allows the word processor to access the printer's built in fonts.

d) This depends entirely upon the resolution of the screen that you are printing. On average though, there are basically 25-pixels per inch for a medium resolution screen.

e) A pica is a unit of measurement used in DTP.

f) The easiest way is to turn off AMOS' automatic bob updating system and update the bobs manually within a 'main game loop'.

g) Turning off automatic bob updating will solve this too. But try to avoid using print – AMOS's TEXT function is much faster.

h) Yes, the Add command is a lot faster than the more conventional SCORE=SCORE+10 command. It's not really possible to use DEEK and DOKE unless you know the exact address of the SCORE variable.

i) Yes, the AMOS compiler will speed up virtually every aspect of your AMOS code.

j) To get a full high resolution screen, just use the 'LACE' option with the screen open command. For example, 'SCREEN OPEN 0,640,512,16,HIRES+LACE' will open a 16 colour high resolution screen. Earlier versions of AMOS didn't have this option, so you may have to purchase an AMOS update disk to get this to work.

k) AMOS Pro has a Hardcopy command, so an upgrade should be at the top of your shopping list.

l) For assembler language programming, the only real choice is HiSoft's *Devpac version 3*. It costs £69.95 and is available from HiSoft on 0525 718181. ***JH***

STRIPEY SCREENS



I have recently upgraded my Amiga 500 from 1.3 to 2.0 which I have found very easy to work with, but sometimes when I work with applications which need a great deal of chip RAM, such as sampler programs, sequencers, *Deluxe Paint IV*, word processors or just games that use advanced graphics (*A10-Tank Killer*, for instance) strange stripes appears on the screen. Sometimes they just flick but sometimes the machine will guru, which is the case when I work with *Audition IV*. If this has occurred, I will after a reset get black horizontal stripes along the borders on the Workbench screen, and sometimes I will also get diagonal stripes all over workbench. The 'Reset WB' command doesn't work, but sometimes the 'Backdrop' setting will and the stripes will be gone when I unselect Backdrop.

Now I am writing with *ProWrite 3.2.4* and I have got annoying stripes and blurs all over. The scroll gadget to the right is completely destroyed. I have made the 1Mb chip RAM modification and I have checked the solderings and cuts but they are all OK. What could be wrong? Could it be possibly due to the fact that my internal chip memory is 60ns? It says so after the series number on the IC. Is my expansion memory 120ns as stated with "-12" on the IC? I also have another question: How come I could buy issue No 17 for September in the second week of August?

Resus Carlsson
Malmo
Sweden

I think your chip RAM problems are due to the speed of your RAM chips. Yes, your internal chips appear to be 60ns and your expansion RAM is 120ns. That is too slow for your machine – try and get a board with 80ns or less, preferably one of the four-chip designs.

You got your magazine in the Second week of August because it obviously took two weeks to get to you from the UK. As I write (27th September) the November magazines are just popping through the letterbox. Magazines tend to come out over a month before their cover date – this is so journalists can start their Christmas parties at the end of October. ***JR***

HEAD GO SLOW



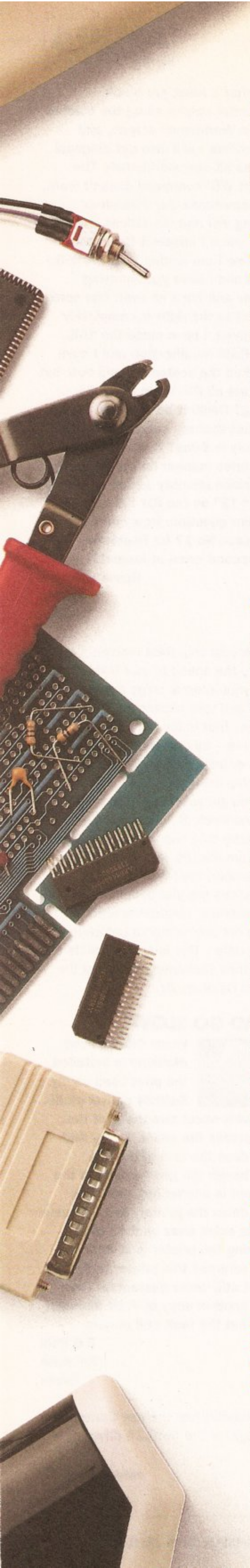
When Citizen *Print Manager* is installed, the print head on my Swift24 printer stalls. It travels about two-thirds of the way across the paper, stops, and then does the rest of the line.

Though the good quality of the printout is unaffected, this does slow down the printer, and I assume it puts extra wear on it as well. Thinking the printer is at fault, I have returned this printer to Citizen whilst still under guarantee. I have tried another copy of *Print Manager* disk, but the fault still occurs.

E G Pohl
Rainham
Essex

It's probably just the way Citizen *Print Manager* or the Swift 24 driver

continued on page 60



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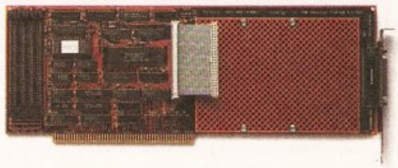
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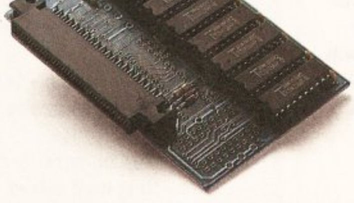
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works. Or it could be the program that is doing the printing (you didn't say what it was!). I shouldn't worry too much, it certainly will not harm the printer. ***JW***

MORE MONITORS



Recently I bought a Samsung CI5322T television to use with my Amiga 500. The TV has a SCART socket on the back so I decided to connect my Amiga's RGB port to it. The connections are as follows:

AMIGA		SCART
5	BLUE	7
4	GREEN	4
3	RED	3
22	+12V	8
10	C SYNC	20

But when I plugged it in all I got was a black screen. I know the video switch works because all the channels were the same (switched to AV channel). The only time I could get a picture was when I put the TV in Teletext mode and I could see the Amiga's picture behind the on-screen graphics of the TV.

I have tried putting a 150 Ohm resistor on pin 8 (as advised in *AS* 19), but the problem still occurs. Can you tell me the correct wiring?

Michael Batiste
Warrington
Cheshire

Michael – unless your Samsung has a really weird SCART socket I think you've got your wires crossed. You'll find that in most cases pin 4 of the SCART is for an audio earth and pin 3 is an audio output – so no wonder nothing much is happening on the picture front for you. Take a look at the earlier letter and try that connection arrangement, or contact Meedmore ☎ 051 5212202 or Trilogic ☎ 0274 691115. ***GW***

QUANTUM LEAP



I have an Amiga 3000 25/100 with Workbench 2.0, one of the first 3000s to reach the UK. I recently purchased a Quantum 100Mb internal hard drive to use principally for my AMaxII Plus emulator, but also as a data storage device because my floppy drives (internal and external) were becoming unreliable – as likely to corrupt a disk as to write to it!

I fitted, formatted and partitioned the second hard drive through *HDToolbox* and the devices winked happily throughout the process. However, no icon for the drive or its partitions appear on the Workbench, neither is it acknowledged by any of my software. The drive is set to SCSI address 3 with the original drive at 6. There appears to be no way to change the LUN of the drive through the Workbench 2.0 software, neither can Autoboot be set to 'off' as CBM Technical Department suggest. How can I make the drive usable by the system?

Also, DF0: has now given up the fight and is represented by DF0:???? on the Workbench. My external floppy seems happy to read data files but any attempt to write to disk or format a disk corrupts it beyond repair. The nearest Amiga repair centre is about 6000 miles away. What do you suggest?

C H Corker
Francistown
Botswana

JARGON BUSTING • JARGON BUSTING

ASCII – American Standard Code for Information Interchange. It is the data storage method commonly used when we type text files and enables data to be exchanged between different computers.

Interlace – a method used to double the apparent vertical resolution of the monitor by alternately refreshing the screen at a slight vertical offset.

Printer driver – a program that sits inbetween any applications program producing output and the printer. It converts any codes describing text and graphics format into a form suitable for a specific printer.

RGB – Red Green Blue – a standard for video signals that provides better quality than composite or Radio Frequency signals.

SCSI – Small Computer Systems Interface is the standard used for connecting hard drives, CD-ROM drives and tape back-up units to computers.

Firstly, are you using the latest version of the Amiga 3000 Kickstart (Version 37.175)? If you are not you must upgrade – the early versions originally supplied were very unreliable, and had lots of problems, not least with the SCSI. Assuming you have selected your partitions with *HDToolbox*, select Advanced Options and you can then enable or disable autoboot. Once you have quit *HDToolbox*, open a Shell and type INFO. This will list the devices and your new partitions should be shown, although they are not formatted. Assuming your partitions are called QDH0: and QDH1: for the purpose of this example, type in the following:

```
system/format drive qdh0:
name MyNewPartition noicons
quick
system/format drive qdh1:
name MyOtherNewOne noicons
quick
```

After you have done this, reboot and your partitions should be available.

As for your 3.5" drives, could your climate in Botswana be causing the problems? Try using a disk cleaning diskette regularly in your drives and see if this prevents the problems – it may be a build-up of dust. If it is too late to save your internal drive then replacements are available from good dealers and are easy to fit. If your floppy drive is dead it's not usually economic to get it fixed. ***JR***

HUGE PROBLEMS



I am currently using *Huge* to design windows and images for my C programs. Unfortunately it cannot handle anything approaching a full screen size. Are there any programs you could suggest, either commercial or public domain, that can?

Kevin Lawrence
Pontypool
Gwent

I think you'll find *PowerWindows* will do the job (through its load IFF gadget image options). ***PAO***

STREAKY COLOURS



Please could you help me to sort out my printing problems, samples of which are enclosed. These have been printed by a Citizen Swift 24e using Citizen *Print Manager*.

I have tried all possible combinations from the various *Print Manager* prefs screens, but I have been unable to get two consecutive identical printouts. By that I mean that the corruption is different each time, even though no settings have been changed.

This corruption does not seem to happen using the EpsonQ and EpsonJX80 Workbench Preferences drivers, but the overall quality is not as good as the good parts done with Citizen *Print Manager*.

Why does the yellow always have red dots in it? By the way, the printer ribbon goes loose and then 'fluffs up' when *Print Manager* starts to corrupt.

Robert Harling
Kingswood
Bristol

The 'streaky' printouts you sent me are caused by the ribbon feed mechanism going haywire. This could be a fault with the printer itself, or it could be a dodgy ribbon cartridge. You really should contact Citizen, or the dealer you bought the printer from, and ask their advice.

The JX80 and EpsonQ drivers put red dots in the yellow bits because, frankly, they are old and quite poor printer drivers. Try playing with the Colour Correct buttons in Workbench Printer Preferences (Graphics 2) to see if there is any improvement. The Swift 24e emulates the Epson LQ-850, so it should work with the much better Star24Plus printer driver (which, handily enough, is available from JAM on ☎ 0895 274449). ***JW***

YET MORE MONITORS



I have a chance to buy a second-hand Digivision monitor, model No MC20 RGB 10-010. At the back are eight BNC sockets grouped in four pairs – red, green, blue and sync. The sync sockets do not indicate whether they are composite, vertical or horizontal sync. Next to each pair of sockets is a switch marked TERM.

If it is possible to use this monitor with my Amiga 500 can you give me details of where I can get a lead from?

Keith King
Pontefract
W. Yorks

As far as I am aware Digivision are no longer in business, but if the monitor is working OK that should be no reason to put you off – as long as you don't expect to buy spares, have it serviced and such like.

The pairs of BNC sockets will be for input and loop through, which is why there is a TERM switch next to each pair. If the signal is not looped out to another device the TERM switch must be set to ON or 75 Ohm as this supplies the proper loading for the signal. The last device in the system should always be terminated.

I think that the sync input is probably going to be composite, so you'll need a lead which has an Amiga 23-pin connector at one end, wired up to separate BNCs for Red, Green, Blue and Composite syncs. Don't forget to ground each connector as well. Use good quality cable and to make things easier you may find that building a breakout box will be simpler than trying to cram all the cables into the back of a D-Plug

cover. Connect up the signals, make sure the terminations are correctly set and you should be up and viewing in no time! ***GW***

FAX OF LIFE

I own an Amiga 600 but with no other expansions except a Citizen Swift 24 printer. My problem is as follows: I am trying to get my fax machine to be a scanner. I nearly did it on the C64, but Basic does not run fast enough – the routine needs to go at over 2MHz! Anyway, I have got the scanner hooked up to the joystick port and I need to know how to write the routine into *DevPac* and save the screen produced.

Another problem, is that the manual does not say how many pixels are across the screen at maximum resolution. If you could give me the bare bones of this in assembler, I would be extremely grateful and subscribe to *Amiga Shopper* forever!

Evan Tuer
Pitlochrym
Perthshire

If by 2MHz, you mean 2 million operations per second, then I'm afraid you're out of luck. The standard Amiga 600 does less than 1 million instructions per second, so you're going to have problems. On the other hand, you may still get it to work if this is not quite the case. Below is a simple routine that checks to see if the joystick is up, down, left or right. By calling this routine and checking the return values, you should be able to do what you require:

```
;     JoyStick.i
;  void JoyStick()
;  No inputs, No Outputs, no
;  registers corrupted. Sets
;  one of four flags,
;  js_Up/Down/Left/Right
;  depending on joystick
;  movement.

_CUSTOM:       equ $dff000
include "hardware/custom.i"
;
JoyStick:
       movem.w d0-d1,-(sp)
       lea     _CUSTOM,a5
       move.w  joy1dat(a5),d0
       btst    #$01,d0
       bne.s   JS_Joy1Rite
       btst    #$09,d0
       bne.s   JS_Joy1Left
JS_CheckUD:
       move.w  d0,d1
       lsr.w   #$01,d1
       eor.w   d0,d1
       btst    #$00,d1
       bne.s  JS_Joy1Down
       btst    #$08,d1
       bne.s  JS_Joy1Up
JS_Quit:
       movem.w (sp)+,d0-d1
; Joystick movement code.
       rts
JS_Joy1Rite:
       st.b     js_Right
       bra.s    JS_CheckUD
JS_Joy1Left:
       st.b     js_Left
       bra.s    JS_CheckUD
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JS_Joy1Down:
       st.b     js_Down
       bra.s    JS_Quit
; Stubs to set flags.

js_Up:    dc.b 0
js_Down:  dc.b 0
js_Left:  dc.b 0
js_Right: dc.b 0
; Flags for movement
```

TS

HOME FOR HARD DRIVE

Having fitted a 52Mb Quantum drive in my A590 I now have a 20Mb drive doing nothing. The drive is a Western Digital XT drive. Is there any way I can utilise this drive by connecting it up to the A590 connector, or am I better off binning it and saving for another SCSI drive?

John Fuller
Blackburn
Lancs

Don't throw your drive away! It would make an excellent door stop or book end, or a surreal addition to any designer fish-tank. Yes, your 20Mb drive is really not worth using. Your best bet is to offer it second hand to someone who has managed to blow up the XT drive in their A590. ***JR***

WHICH MONITOR?

I'm lost! Monitors, monitors, monitors – there's almost too many to chose from!

What monitor do I need to get TV or video quality from my Amiga 3000? Can I get rid of the jaggy edges? Do I need a video card? And if so, which one?

Markus Rischer
Dublin
Republic Of Ireland

Well no, you don't need a video card. Firstly, because the A3000 already has a built-in deinterlacer or "flicker fixer", you can connect it directly to a multisync monitor such as Commodore's 1960. Secondly, you can connect directly to any SCART equipped monitor from the RGB port of the 3000 (assuming that you have the correct lead, of course).

Your choice of monitor mainly depends on whether you want to do video work and animations, productivity applications or DTP work, and of course on how much money you want to spend. If you want to do animation and play it back from your computer then a normal 15.6KHz RGB monitor such as the Commodore 1084S or Philips 8833 will do you fine, though you'll have to live with the interlace flicker. If you want rock steady display then you'll need a multisync, and if you want both you'll need a multisync which can run at 15.6KHz as well as 31.2KHz, as animations tend to look strange when deinterlaced.

As for the jaggies, if they are part of your image then you'll see them, as the monitor only displays the signal it is fed. That's just how it goes, I'm afraid. ***GW***

THE GREAT ESCAPE

I'm creating a disk of reviews and POKEs for a computer fanzine that I'm producing. I start by typing out the reviews using Workbench's *NotePad* utility and then I convert the files to ASCII files using *Kindwords*. CLI escape codes are then added using *MeMacs*. As you can probably start to appreciate, this is quite a long-winded process. Is there a word processor (commercial or PD) that caters for all of the CLI escape sequences? Is *Wordworth* suitable for this particular application?

Could you also tell me whether there is a program available (again, PD or commercial) that is capable of producing 'countdown' clocks for DTV use like those used by TV companies. The program should be able to count down to three and then show a logo. Please help.

Alan Britton, Cressing, Essex

The process you're using to create ASCII text files is certainly long-winded, Alan. Why not just use *MeMacs* to type all your copy? Ok, it's not quite in the same league as a dedicated word processor, but at least it's considerably faster than both *NotePad* (an abysmally slow program) and *Kindwords* (even worse!). If you really are opposed to using *MeMacs*, then why not check out any one of the many PD text editors available? Most offer word wrap and full support for embedded escape codes, although you'll still need a reference guide to find the exact codes you need.

As for the PD video clock program, you'll be pleased to learn that you're in luck. What you need is the *Video Presentations* pack which is available from George Thompson Services. This pack includes a wide variety of video-related PD programs including a video clock and *VideoTools*, an excellent little utility which can produce a wide variety of video test pictures. ***JH***

DELETE AS APPLICABLE

I have *KindWords 2*.. I have saved my work to disk and I have looked through the manual for a way to now delete it, but so far I have had no luck.

So, basically, I would like to know how to delete. Maybe I have a block somewhere.

H Coomer
Liverpool

The Amiga is a multitasking machine. This means (among other things) that many of the day-to-day disk housekeeping type jobs can be done from Workbench rather than from within any particular application.

To delete any file, bring the Workbench screen to the front, find the file's icon and click on it *once*, then select Delete from the Workbench menus. If the file does not have an icon you will need to open a Shell or CLI window and use the AmigaDOS Delete command. ***JW***

DPAINT III PROBLEM

I have installed *DPaint III* (and its associated files and directories) on my Amiga 1500's hard drive. But when I try to load animations or other items from their icons I just get a requester saying 'Insert volume Dpaint in any drive'. It appears that the Amiga does not know or recognise that it is already on the hard disk. What's the trouble?

S Rolton
Bexley Heath
Kent

Don't despair, Mr Rolton, the solution is easier than you think. What is happening is that each of the icons you are trying to use has a sort of direction pointer attached to it which first calls the program that it needs to run the animation, display the picture or whatever. You can see this path by first clicking on the icon once to select it, then selecting Info from the Workbench pull-down menus. A display with quite a lot of information will appear, with a text box which might say something like 'DPaintIII:DPaint' to the left of the words 'Default Tool'. This is the crux

continued on page 66

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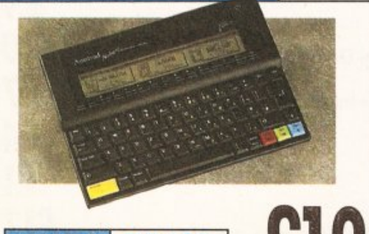
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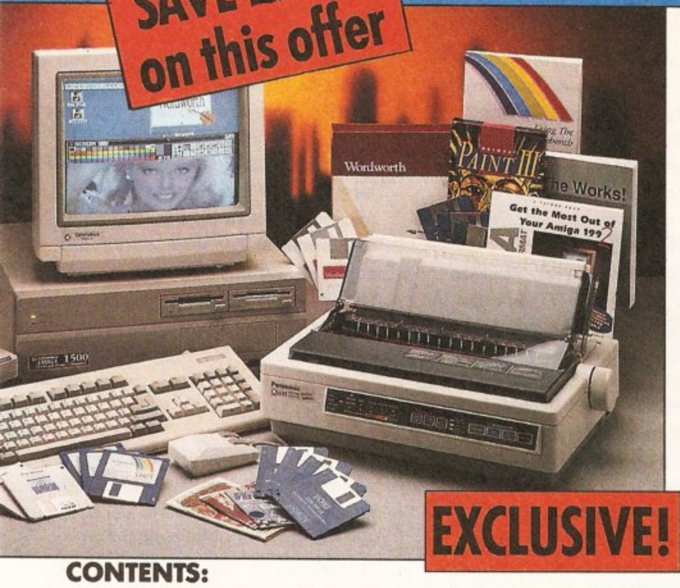
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of your problem, because every time you double click on the icon it attempts to run *DPaint* from a disk called DPaintIII.

But as I said the solution is simple. Click in the text box of the Info requester and then replace the words 'DPaintIII/Dpaint' (or whatever it says in your case) with the correct path name for wherever the *DeluxePaint* program is stored on your hard disk. This might be along the lines of: 'DH1:Graphics/DPaint'. Save this setting and try double clicking on the icon again. If you have been successful *DPaintIII* will load and display whatever the icon represents (assuming it is a picture or anim). Then check each of the relevant icons you transferred and change them if you need to. And please, don't type in the '' signs, they are just there for clarity.

If you can't work out what path name to use, run *DPaintIII*, make a quick picture and save it. Then check its Default Tool from the Info menu and you'll see it clear as day.

Now you've discovered Default Tools you'll find how easy it can be to display text files, run animations and so on all with just a simple double click of the mouse. ***GW***

PROTECTION RACKET

I've been working on a Home Accounts program in Amiga Basic and the listing is more than 20 pages long. Last week I happened to save it as "HomeAcc",P (in other words, as a list-protected file) and that was a big mistake since I had not kept a backup. Is there any way I can get the listing back to normal Amiga Basic in ASCII or do I really have to type it in all over again?

Egil Lovang
Oslo
Norway

Sorry, but I think you are going to have to re-type it. In theory, if you knew the encryption method that Microsoft use, it would be possible to read the program as a binary file and decipher it. Unfortunately I don't know of this and I've not heard of anyone successfully deciphering an AmigaBASIC protected source. If anyone *does* know – send me details and I'll pass them on! ***PAO***

CARTRIDGE CAPERS

I have recently heard that the Amiga Action Replay cartridge from Datel Electronics does not work on a machine with more than 3Mb of RAM. Is this true or am I just very gullible? If Action Replay does work with a machine with more than 3Mb, could you recommend a good (preferably cheap) 4Mb expansion for my A500.

Brian Hatter
Chestnut
Herts

Datel don't like to publicise the fact, but the Datel Action Replay cartridge most certainly doesn't like machines with more than a minimal amount of RAM. When I last spoke to Datel concerning this incompatibility program, they informed me that the cartridge would only work on machines with 2Mb or less. I'm not quite sure whether this also applies to the new Mk.3 Action Replay, but I doubt whether this problem has been solved simply because of the way the cartridge works.

If this still hasn't turned you off of buying a RAM expansion, then I'd highly recommend the Cortex range of RAM expansions. Check out the advertisements in this issue for the best pricing. ***JH***

SEQUENCE OF ERRORS

I own a Roland MC-50 sequencer used with a Roland synth. When I bought my Amiga the idea was to use it as a second sound source. I have tried using *Sequencer One* (and *OctaMED*) but so far I can only get sounds playing for two samples. Can you tell me how to set my system up?

Johnathan Amor
Thatcham
Berks

With *Sequencer One* each track can be made to play an internal sound rather than a MIDI instrument but you need to remember that the Amiga sound channels play two voices on the left and two on the right. To control four samples therefore you need to select two 'L' and two 'R' track settings. ***PAO***

IDE CONNECTIONS

I have recently purchased an IDE Quantum 52Mb hard drive and would like to know if I could use it with my Amiga 500 Plus. If the answer is 'yes', what peripherals would I need to set it up?

B Johnston
Airdrie
Scotland

There are now two or three new AT-IDE controllers for the Amiga 500/500 Plus although I have not been able to test any of them yet. ICD have done an AT-IDE interface for quite a while, but it requires fitting inside your Amiga and you will lose your internal floppy when you fit the drive, so avoid it.

IVS make the IVS Trumpcard AT 500 which will work with your drive and Dataflyer have just launched their new Dataflyer Express which can support both AT IDE and SCSI drives in one interface. ***JR***

COLOUR DTP

I wish very much to buy a DTP package in order to produce colour cassette covers. But I've read somewhere that *PageStream* and *Professional Page* produce graphics on mono only. Is this on the screen or on the final output?

I already own Citizen Print Manager, but I'd like to print the odd poster or two. Does *Turboprint Professional* have a driver for the Swift 24? Finally, which DTP package gives the best colour IFF results on a dot-matrix printer when printing cassette sized covers?

Dewter P Hackenbecker
Erith
Kent

Both *Professional Page* and *PageStream* can display colours on-screen and output them to printers. IFF-ILBM graphics are displayed on-screen in black-and-white in *PageStream* and in four greys in *Professional Page*, but these are just quick screen representations – both packages will print in colour.

Professional Page works with Citizen *Print Manager* and *Turboprint Professional* (which does come with a Swift 24 driver), *PageStream* doesn't work with either. For this reason *Professional Page* will give you better colour dot-matrix output than *PageStream*. ***JW***

TURBO TECHNIQUES

I have been using *TechnoSound Turbo* to produce voice samples for a utilities disk that I am compiling. I am however unable to play the samples via CLI. Is there any way in which I could do either this or convert the samples to a form which I can play using the PlayMOD command? I have been saving the samples in IFF format, but I could quite easily convert them to binary. The song sequencer in *TechnoSound Turbo* could be the answer but it's a bit tricky to use given that I have only 1Mb of RAM.

Daniel Page
Dyfed
Wales

Your best bet is to lay your hands on a program which is capable of either playing samples from the CLI or – even better – a utility which can convert an IFF sample to an stand-alone executable. You'll be pleased to know that the PD libraries have the answer here. Just contact your local PD supplier and they should be able to furnish you with the appropriate disk. In particular, you may want to check out *PlaySound* on Fred Fish disk 684. ***JH***

ON THE MAKE

I am writing to ask you for a bit of advice about a business venture I have been thinking about for quite some time. It involves printing out the documents from public domain disks and magazine cover disks.

There is quite a lot of information I would like to know, but the main points are:

a) Would it be a viable proposition – in other words, is there a need for such a service?

b) Would it be an infringement of copyright to print the documents, and would I need permission?

c) What sort of printer would I need for this task?

d) How much do you think I would I be able to charge?

e) Which printing program would be best? I have heard of something called 'Land Scaping' where

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Sample – a digital (or computerised) representation of a sound. A sample can be sent through a digital to analogue converter (the Amiga has four of these) and be heard as a sound. Changing the speed at which the sample is played back changes the frequency (or pitch) of the sound.

Sequencer – a piece of software on a computer (or sometimes built into a keyboard) which stores musical scores and transmits this information in real time via MIDI to synthesisers which will then play it. Some sequencers have the facility to receive and memorise MIDI information from a music keyboard so that music can be entered 'live' instead of note by note.

Shell – a method of communicating with the Amiga's operating system via the keyboard rather than the more usual mouse and windows method of Workbench. The Shell is the interface which 'surrounds' the Kernel, the central part of the operating system. The terminology comes from Unix systems.

BEEPING DRIVE

When I power up my A590 the drive makes the most horrible "beep... beep... beep..." until it finally boots up and all is well. It only happens on a cold start, and if I boot from a game or something first, there is no problem. It has come on gradually and I first thought the 20Mb drive was fragged out, so I backed it up, reformatted, and the problem still persists. The system never reports any errors, and I don't have any problems after the initial boot-up. I intend to buy a 52Mb Quantum drive to put in the 590 at a later date. Will this solve the problem?

Paul Stanley, Stamford, Lincs

Your problem is very common, and although it isn't harmful you'll have to put up with it until you ditch your less than wonderful XT drive. Replacing it with another drive will solve your problem, although remember that Quantum SCSI drives are no longer available (unless you want to buy 100,000) so I'd save up your pennies to get the 120Mb Maxtor drive, the smallest SCSI drive now readily available. ***JR***

documents are printed lengthways so you can make small booklets.

R Wood
Bognor Regis
W Sussex

a) I don't know if there is a need for such a service. I doubt it. Judging from the number of printer-related letters I get, I'd say that most *Amiga Shopper* readers own printers, so are able to print out instructions for PD programs for themselves.

b) It is not a breach of copyright to print the documents that come with PD programs, but it certainly would be against the law to sell copies of those documents – for any amount of money, or for payment in kind – without the written permission of the copyright holder. You may even be breaking the letter of the law if you give copies away for free.

c) A laser printer will be able to churn out duplicates for you at between four and eight pages a minute, but it'll probably work out cheaper and quicker to print one master copy and get it photocopied.

d) Without the permission of the copyright holder, you may not charge for providing printed documentation. Remember, although the type of program we are talking about is referred to as 'public domain', it is not *in* the public domain in the legal sense of the term. Magazines use the term 'PD' because it is easier to write. In actual fact almost all of these programs are either 'shareware', 'freely redistributable' or 'freeware'. In almost all cases "All Rights are reserved worldwide" and copyright is claimed by the author in the documentation. The program and any associated files (like the documentation) belong to the author. This is to prevent people starting "business ventures" and making money for themselves out of another person's hard work.

e) To produce the type of A5 booklet you are talking about, the best bet would be either be a desktop publishing program like *Professional Page* or *PageStream*, or the *AmigaTeX* typesetting package. Whichever you choose, to be productive you'll need a hard drive, lots of memory, and probably an accelerator board. ***JW***

LIBRARIAN REQUIRED

Does an editor/librarian program exist for the Yamaha SY22/SY35 synth? If not can AMOS be used to read and write data to the voice memory locations?

John Truman
Penn
Wolverhampton

As far as I know there isn't one available at the moment. *But...* Dr T is in the middle of producing an XOR definition at this very moment, so it is only a matter of time before XOR will provide the support you need. I've not used AMOS to do any system exclusive work but since I've done similar thing (on other synths) with AmigaBasic I should imagine that a few AMOS experiments would be worth trying. ***PAO***

AMBITION TO ANIMATE

I am planning to produce an animated video using just pure ray-tracing, but I am having some problems which will hinder this. I have an Amiga 500 with 5Mb of memory, 25MHz CSA Mega Midget Racer ('030) and a 52MB hard drive.

a) Since I installed the CSA MMR the Shell no longer works, although the CLI still does. When I try to use the Shell it comes up with an indecipherable software error.

b) When rendering animations using *Real 3D 1.3* (which still takes bloody ages – stick a mirrored surface in and you're guaranteed 45 minutes per frame) I can only run about 80 frames in the 5Mb of RAM that I have. This means that I'll have to record lots of short sections of animation and then edit them together later. Is there any way of increasing the amount of frames I can play back? Incidentally, I don't think *Real 3D* saves a Delta animation (just the differences between consecutive frames) but saves each picture separately. How do PD ray-traced animations use more than 100 frames which all fit on the one disk?

c) Is there any reasonably cheap way of editing the video myself so that it runs without a hitch and looks all lovely? What are the minimum equipment requirements for the job? Is a genlock essential?

d) I'm thinking of buying *Imagine 2*, but it's a hell of a lot of money (again). Is the animation management better than *Real 3D*'s? What is RTAP and is it easy to use?

e) On the subject of adding music to video, I have a 4-track (without sync), *OctaMed Pro* and a Zoom 9020, with guitar of course. Can I get the music sequences timed to the scene changes in the animation without spending hundreds of pounds?

f) How on earth do you do a donut and a spring with *Real 3D*? I think it's absolutely impossible!

g) Taking a look at *Amiga World* it has occurred to me how much British people are ripped off in terms of extras. For instance, *Imagine 2* costs US $209, but £190. These ridiculous prices are the same on everything from joysticks to 24-bit cards. DCTV $399 there or £399 here – come off it! Please can you justify this?

As an afterthought – is a single frame VCR any use for recording each frame separately to tape instead of running the animation on the Amiga and taping it? Would this solve the editing problem?

S Hamilton
Ayr
Ayrshire

Well S, several chapters of a book would be required to fully answer your queries. I'll do my best to answer your extensive list, but I'll have to keep it brief.

a) You shouldn't be having problems like this. I suggest that you double check that you have installed the CSA utilities properly and that your startup-sequence is correctly organised, as this is likely to be the root of your problems.

b) *Real 3D* is a little strange in the way it handles animations. After rendering all the frames you must compile them into an animation using the *DeltaConvert* program. Make sure you save the results in Anim5 format and then quit *Real 3D*, otherwise the original frames will still be held in memory. Then use a player program such as *View* to replay the animation. Another point to bear in mind is that *Real 3D* makes multiple copies of objects while doing wireframe views, so these too reduce the amount of available memory.

Remember that it is very difficult to judge how much memory a delta animation will take up, though it's true to say that the greater the changes between each frame then the larger the animation file will be. More colours, frames and higher resolutions will also tend to produce larger animations. So you can see why a 100 frame animation can take up substantially less space than an 80 frame one. If you have *Deluxe Paint 3* or *4* you can test for yourself how many bytes animations in different resolutions and colours might take up.

c) The short answer is no. But it's actually more complex than that. For instance, if you want premium quality you'll need to consider producing 24-bit images, which take up massive amounts of storage and require a 24-bit card with video output for single frame recording to a video recorder capable of frame-accurate recording.

An alternative method, which will inevitably result in some quality loss, is to record sections of non-24-bit animation to the best quality video format you can afford. Then, when you have enough material recorded, edit it all together, along with the music. You may well need to find an edit suite to hire so that you can do this. Whatever, there's no avoiding the fact that quality costs money.

d) If by this you mean "Does *Imagine* make animations directly?" then the answer is 'Yes', it does handle animations better than *Real 3D*. *RTAP* is a simple-to-use CLI program which allows you to play back animations larger than available memory directly from disk, with adjustable parameters for speed, looping and so on.

e) If you can define *exactly* how many frames of animation will be in each scene, and *exactly* how the music works with the animation, then you should be able to calculate the precise timings for your soundtrack. If *OctaMed Pro* can work in 25ths of a second (which I don't know as I don't have it) then you'll be able to get spot-on timing. However, you'll need to edit the soundtrack onto the animation after the pictures have been recorded and for accuracy at this stage you'll need to have access to a frame-accurate edit suite.

By using multi-track layering (as video decks at this level have at least two separate audio tracks) it should be possible to build up the soundtrack to your specifications.

Mind you, it is very time-consuming and painstaking work, so plan on spending at least as much time on the soundtrack as the animation. And of course this could cost a substantial amount of money.

f) For the donut, lathing a freehand circle around a vertical axis will sort you out. As for the spring, there are two possible ways, though both are a bit of a compromise. The first method is make a cylinder and use a material liked Striped with spiral wrap, NO 0-COL and CLIP MAP in operation to make a see-through spiral. The second is to create or acquire a spring in *Sculpt* format and convert it with the *SculptToReal* utility. *Real 3D v1.4* will allow you to model a spring yourself, but that's no help to you as you don't have it.

Remember, if you are a *Real 3D* owner, the official help-line is run by Alternative Image on 0533 440041.

g) No, of course I can't justify it. But don't forget that suppliers have to pay VAT, import duty and carriage from the US *before* they add on their own costs and profit margin. Since you wrote your letter the $/£ rate has changed greatly, and what this will do to costs remains to be seen.

Finally, I don't know about the facilities you have in Ayr, but it is probably worth your while investigating local (or even regional) editing facilities, community video centres and so on, asking for prices and assistance in your animation projects. Your local Arts Council can supply further details. ***GW***

SCREEN SCENE

My A500 Plus is used with the TV modulator and a Goodmans 14 inch TV. The display is very good but it is slightly shifted about an inch to the right. This doesn't matter when using Workbench and *DPaint* as it can be corrected using Preferences. With other programs, however, there is an annoyingly wide border down the left hand side of the screen. This is especially noticeable with AMOS and I feel that there must be a way of correcting it. Also, could you please tell me whether it is possible to modify a conventional TV to take an RGB unit.

Mr J Freestone
Wanstead
London

I've got some good news for you and some bad news. First though, the good news – there's absolutely nothing wrong with your Amiga whatsoever. Now the bad news – your Goodmans TV needs adjusting. What you are suffering from is simply an image positioning problem. Unfortunately it's not really possible to correct this yourself. Because such a task involves internal adjustments on the TV's tube, it can only be carried out by an experienced TV engineer. You'll be pleased to learn that it shouldn't cost too much to have this problem rectified – it really involves nothing more than a single adjustment to one of the pots inside the TV. As for the RGB modification, I'm afraid the answer's no – It's just not possible. ***JH***

ENHANCEMENT ENQUIRY

I have an Amiga 500 with Kickstart 1.3 which has a 1.5Mb Power Computing memory expansion (with 1Mb chip memory modification). I am considering getting the ECS and Kickstart 2.04 or 2.05. In what way will this affect my memory upgrade? Will I be able to use the upgrade at all, or will I have to get one of the new upgrades designed for the Amiga 500+? If I can use the old upgrade will I still have to undo the chip memory modification? I would also like to know what is the maximum chip memory I can have under the new chip set; where can I purchase it from, and at what cost?

David Aughey
Portadown
Co Armagh
N Ireland

Your 1.5Mb expansion will work fine with Kickstart 2 and the ECS Denise chip fitted. You don't need to get A500+ expansions, which won't work with the Amiga 500 even if upgraded with the new ECS chips.

You can upgrade your Amiga 500 to a total of 8Mb of Fast RAM and 2Mb of chip RAM (although to do this requires the DKB Meg-A-Chip board at around £175). ***JR***

FILED FOR LATER

A few C problems: With fread() how do you know how large to set the I/O buffer to, since you don't know the size of the file? How can you find the file size? What does the sizeof(long) do in freed()? When you load a file and write it back you always find garbage (control characters, for example) at the end – how can I get rid of them? Also how can I get a complete list (and details of their usage) of functions and macros in all the C header files?

William Murphy
Chichester
Sussex

I suppose you also want the bouncers dressed in pink! Seriously though, you can get most of this stuff from any decent general C book. However, there is an Amiga-specific way of getting file sizes and that is to use the AmigaDOS Info() function. This fills in a data set that contains amongst other things the filesize (see the Bantam AmigaDOS manual for function call details). The garbage characters you talk about are just the random contents of any unused end locations in the last block!For C header file details you are in luck because a brilliant new book, written by P J Plauger (who chaired the ANSI C committee), has just been published. It's called 'The Standard C Library' and is published by Prentice Hall (ISBN 0-13-131509-9) – it will tell you everything you'll ever want to know about the header file contents and use. ***PAO***

SONIC BOOM BOY

I frequently connect my Amiga up to my hifi (TEAC amplifier with Wharfedale speakers). However, a friend of mine reckons that I could be damaging my hifi due to the high-frequency signals the Amiga is capable of producing. Is this true?

Sam Smith
Alconbury
Cambs

Don't believe a word of it Sam. Although the Amiga is capable of producing some pretty complex waveforms, the frequency response of the Amiga sound chips are (to the disappointment of many) nowhere near that of a CD player. If your amplifier and speakers can handle the signal produced by a CD player, then you can bet that it'll handle your Amiga with no significant risk of damage to either. ***JH***

RAM UPGRADES

I recently bought a second-hand 512K Amiga. It has a 1.3 ROM upgraded from a 1.2. It also has Fatter Agnus (8372A) and it has the _EXRAM track disabled and Pin 41 isolated.

a) I wish to upgrade to 2.5Mb with 1Mb chip and 1.5Mb fast RAM using one of the trapdoor expansions available, and as far as I am aware the above modifications disabled the trapdoor expansion slot from using fast RAM. Is this true, and if so how can I go about increasing the memory to the desired level (preferably still using the trapdoor)?

b) I am also interested in learning assembly having programmed in BASIC for a number of years, and I am hoping you could tell me the best way to go about it. For instance, are there any good books or software to buy?

James Kavanagh
Co Wicklow
Ireland

It's not recommended to put any more than 512Kb in the Amiga 500 trapdoor slot, although there are some 1.5Mb boards that will give you 1Mb of chip and 1Mb of fast. True fast memory should be added to expansions that plug into the side expansion of the Amiga, and the Cortex is the best of these I have seen.But it may be better if you get a combined Hard disk/Ram interface like the GVP or Commodore A590.

The first thing you need for learning assembly language is a decent assembler, and there is only

WHY SO LONG?

I am having trouble with my new printer, a DeskJet 500. Before this I had a Citizen 120D+, and used *Excellence 2* quite happily with it. The trouble is that printing takes about 10 minutes using Graphics print and the Amiga bitmapped screen fonts. Can you please explain what the problem is? Is it the printer driver, the printer, or *Excellence*? Is it that the printer doesn't have enough RAM, as it will print one line and then wait about 20 seconds before printing another?

Peter Campbell, Cullybackey, Norn Iron

Your Citizen 120D+ has a maximum resolution of 240 by 216 dots per inch, so a square inch of graphics printout will contain a total of 51,840 dots (240 multiplied by 216). The DeskJet 500 has a maximum resolution of 300 by 300 dots per inch, so the same square inch now contains 90,000 dots. Just from this you can see that almost twice as much data is having to be being calculated, passed to the printer, and then printed.

That's the main reason the DeskJet 500 takes longer to print graphics than the Citizen 120D+, but the problem is compounded by the printer itself being a bit slow at printing bitmapped graphics (most inkjets and lasers are), and the Workbench HP_DeskJet printer driver not being very good at its job.

The only way to significantly increase the speed of graphics data calculation and transfer is to fit a faster CPU – with a 68030 board and some 32-bit memory fitted, for example, that 10 minute wait will drop to under two minutes. And yes, I appreciate we're talking lots of money. I wish there was a cheaper solution, but there isn't. ***JW***

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Font – the group of letters, numbers and special characters that comprise one variation of typeface, for example: 12pt Times, 12pt Times Bold, 12pt Times Italic. Sometimes (mistakenly) used in desktop publishing to refer to a type family.

Modulator – a device which combines the output signal from a video source with a high frequency signal for further transmission. The video source is said to be modulated with the 'carrier signal'. This is required for input into TVs, which receive their signals at high, radio frequencies.

RAM – Random Access Memory, so called because any part of it can be accessed immediately, rather than having to search through from the start of memory to the point of interest. RAM is used to hold programs while they are being executed and temporary data. The contents of RAM are lost when the power is switched off.

one choice for the Amiga now, *Devpac 3.0* from Hisoft. There are two or three books on learning 68000 for the Amiga, although I have only read one, the Abacus 'Amiga Machine-Code Programming', which isn't very good at all. If you want to program games you will need the Amiga Hardware Reference Manual, for more serious programming the rest of the manuals, Rom Kernel Libraries, Devices, Autodocs and Style Guide books are needed. A personal favourite book of mine is 'Mapping the Amiga' by Compute! which is an excellent little reference book, although it does not claim to teach you how to program, and it only documents functions present in Kickstart 1.3, not the new Kickstart 2.0 or above features. ***JR***

FONTS WITH GFA

Having started to write some programs using GFA Basic, I have stumbled across some problems. How do I load and use different fonts ?

DA Munro
Mossley
Lancs

You need to first use the Exec OpenLibrary() call to open the diskfont library. Having done that you need to set up the Basic equivalent of a TextAtt structure and then call the OpenFont() routine. The system calls are explained in the GFA manual but *Amiga Shopper* ran a GFA Basic series from issue 7 to issue 10 which will provide you with more tutorial help on library call use. ***PAO***

UPSTANDING CITIZEN

I have recently received the Citizen *Print Manager* program free of charge as mentioned in your magazine recently. The problem is, the *Print Manager* is so big that it won't fit on my *DPaint* program disk! As I am not interested in animation, what directories/files can I delete to make room for the *Print Manager* program? What else could be sacrificed? I also enclose a copy of the output from my 'as new' printer. Will the *Print Manager* remove horizontal banding?

In your July issue you stated that in view of the discontinuation of the A500, owners should upgrade to the new chipset and Workbench 2.04. Could you please provide specific details of the chip set and what should be done to fit it. What will it enable me to do? Also, is Workbench 2.04 on these chips or is that something completely different? If I upgrade, will software such as *AmigaBASIC*, *DPaint 3*, and *Wordworth* continue to run?

Finally, what are the differences between AMOS and AmigaBASIC? Is it worth buying AMOS if I already own AmigaBASIC?

D Ludgate
Lightwater
Surrey

There's not really a lot on the *DPaint 3* disk that you can lose without effecting the workings of *DPaint*. If you're satisfied with your Preference settings, then you could delete the 1.3 Preferences program I suppose. Failing that, why not use a program file cruncher such as *Imploder 4* or *PowerPacker* to crunch the *DPaint* program? This will probably free up something like 80k at least! *Imploder 4* and *PowerPacker* are both PD programs and are therefore available from most good PD libraries. Installing the *Print Manager* program won't totally remove the horizontal banding in your printouts, but it can reduce banding considerably.

To be perfectly honest, it's probably not worth your while upgrading a 1.3-based Amiga to Workbench 2.04 and the Enhanced Chip Set unless you own add-ons that connect to the machine's bus connector. Your best bet is to sell your A500 and then use the money that you would have had to spend out on the ECS chips, installation and ROM upgrade kit to buy yourself either an A600 or – better still – an A1200. Upgrading the machine will undoubtedly cost you around about £150 and you'll still be left with a machine which is not completely compatible with current developments (PCMCIA cards, AA chip set software and such like).

Comparing AMOS to AmigaBASIC is like comparing a 1300L Escort to an Sierra Cosworth. Although they are theoretically very similar, AMOS is better than AmigaBASIC by miles. If you don't believe me, why not check out the latest issue of our sister magazine *Amiga Format* – you'll find the complete AMOS program on the coverdisk! If you really want the ultimate in AMOS programming though, go straight for AMOS Professional, the latest (and definitely the greatest) release of AMOS. Check out the review in Issue 21 of Amiga Shopper. ***JH***

CLOCK ADDITION

I have a 512K RAM expansion board by D & S Designs without the battery backed clock and what I would like to do is add the missing components to the board: the battery, resistors, and so on. There is plenty of room on the board and the circuit is intact making this addition possible. I need a full list of missing components from the board plus details of price and possibly a supplier if my local Maplins store do not carry all parts.

Currently I own a 1.3 Amiga as well as a CBM 64, after having started out on a Vic-20 over ten years ago, and so far I have spent a fortune on computer peripherals, games, hardware and other software. My question? is it worthwhile upgrading from one dead computer to another, since the 500 Plus has gone the same way as the 500? What advantage is there is upgrading a computer to ROM 2.0 since there are fewer 500 Plus machines than 500s, and all the software is compatible with 1.3? What I really need to know is what makes the 2.0 ROM worth the £50–£100 in upgrading – certainly nothing that I have read about the 500 Plus so far, as it appears only to enhance the other chips – Super Denise and Fat/Fatter Agnus.

My last question concerns hard drives. It is cheaper to buy a hard drive for a PC than an Amiga, for which I would require a drive either IDE or SCSI. But as I don't know what the difference is between them or why there is a vast price difference between PC and Amiga controllers, I'd like to. Does a hard drive for an Amiga come with a hard drive controller integral to the unit or would one have to be bought?

Finally, on a similar point, would a C64 tape streamer be at all compatible if an interface could be made up to link it to an Amiga?

Gordon Moss
Gateshead
Tyne and Wear

Unfortunately I don't know what you would need to upgrade your RAM board to give you a real-time clock. Your best bet is to try telephoning the original manufacturer.

If you're not sure what benefits a new computer would give you, then I'd say don't upgrade until you are sure. There's no point spending your money on an upgrade when you don't know if it is of use to you. If you use the Workbench a lot then you will love the new Kickstart 2.0. If you spend more time playing games or tinkering around in the Shell, then there are less advantages.

In general it's not any cheaper to buy separate hard drives and interfaces. Apart from having to set everything up yourself, there's the problem that your drive and interface may not be 100% compatible. So It's best to buy a drive and interface together, something like the GVP Impact II, which is better value than buying the drive and interface separately. ***JR***

INCLUDING C

I am using *NorthC* to learn to program in C but when a program calls for system include files such as exec/types.h the program doesn't compile because these files are not on the *NorthC* disk. However I have found them on the *Lattice C* public domain disk and have copied them to my *NorthC* disk. They seem to compile OK but the compiler stops when it can't find functions.h, another include file in my program. Where I can get this file?

J E Aldridge
Walsall

I should imagine that functions.h is just a file of function prototype definitions and if this is so the file will be of no use to you anyway because *NorthC* does not support the use of prototypes. I suspect that the program you are trying to compile has actually been written using ANSI C – if new style function definitions are present the program is not going to compile under *NorthC* anyway. The bottom line is that whilst you will not need the functions.h file that you've mentioned, you will have to check your code just to make sure that it is in K&R style form. Have a look in issue 11 of the mag – there was an article called 'Compiling the PD C's' that shows the sorts of translations that you may need . ***PAO*** AS



Making good looking presentations is now even easier with *Scala's* improved text editor.

Scaling the

With the eagerly-awaited release of Scala MM200, Gary Whiteley asks: has the best Amiga multimedia program got even better?

A new version of *Scala* has arrived. It's been a long time in production, and it shows. *Scala MultiMedia MM200* is BIG – in price as well as in features!

If you're not familiar with *Scala* perhaps I should tell you that it is almost certainly the leading desktop video and presentation program for the Amiga, finding favour worldwide with even seasoned professionals. It is available in several versions and *MM200* is currently the top of the impressive range.

With *Scala MM200* computer graphics, animations and text presentations can be quickly and easily arranged and played back with synchronised sound effects, either automatically or under interactive control. By making use of supported external devices the presentation can also include CD audio, video images from laserdisc and other sources, MIDI music production, and a range of other powerful options. A large selection of high quality backgrounds are provided, along with 17 fonts – most in a variety of sizes – and a wide selection of screen and line transitions.

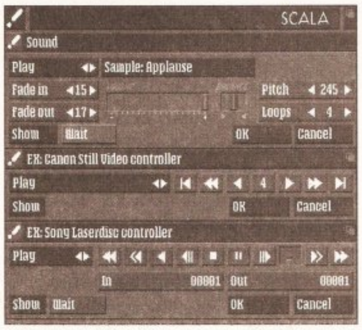


The List Editor is the control centre of *Scala MM200*, unless you prefer the new-fangled Shuffler screen

MASSIVE ATTACK

There's no doubt about it, *Scala MM200*, will be well received by professional multimedia users in all areas of the communications industry, whether industrial or corporate, educational or broadcast. Because once again the core *Scala* product has been remade, remodelled, extended and generally spruced up to provide yet more innovative solutions and help take the chore out of all that ceaseless multimedia choreography.

In addition to consolidating the nucleus of the program by improving and streamlining some of the functions, a wealth of new features have been added to bring *Scala* right up to date. Current *Scala* owners will see that there have been many additions: new device drivers to control external audio-visual hardware, the capacity to play back Amiga sounds and music, improved button handling, ARexx communications, fast hard drive access for ANIMS, recordable timing, improved interface layout and a Shuffler graphic interface. And there are more wipes, more control functions, CDTV support and plenty of interesting demos to study and learn from.



Three control menus – for Sound, Canon Ion and Sony Laserdisc control. You don't normally see three at a time though

SO WHAT'S NEW?

Like the previous 1.13 version, *Scala MM200* comes on eight disks, though this time the data is compressed. Everything can be easily (and selectively) installed onto hard disk, requiring at least 10Mb of space for the whole thing – or more if you choose to save the backgrounds as overscan images, which is another new option.

The best thing is that *Scala* has actually got easier to use, as well as much more powerful. It's easier to set up, and the user interface has been made configurable in that the columns can be user-defined for width as well as function, making it easier to see what you're doing. It's also been dongled (or 'keyed', in *Scala* speak), though at least the key has a pass-through and is very discrete when connected to either the joystick or mouse port.

The simplest way to tell you about the new features is to list and describe them. I've been trying to figure out a better way, but short of coming round to your house with a copy of *Scala MM200* and demonstrating them all individually, I'm afraid I can't think of one.

EX MODULES

EX (pronounced "EE-ECKS") modules are custom device drivers which are used to control external audio/visual equipment. Six EXes are provided with *Scala MM200* to allow to control of the Canon Ion still video camera, MIDI music equipment, Pioneer and Sony Laserdiscs, the VideoComp DVE-10 vision mixer and another Commodore baby – CDTV. Incorporating EX modules is easy – just drag them into the *Scala* StartUp drawer and they will be loaded automatically every time you run the program.

Each module has its own control panel which pops up in *Scala MM200* when an EX function is selected. The user then selects the appropriate actions – whether it be playing a MIDI music file, displaying clips from laserdisc, playing back audio tracks from CDTV, or loading images from the Canon Ion, for instance.

New EXes are being made available which will extend control to a large range of hardware including V-LAN video control, the Phantom SMPTE unit, Harlequin, Impact Vision 24 and OpalVision graphics cards, G2 Videocenter and Magni genlocks, the Video Toaster, a wide range of Panasonic, JVC, Philips, NEC and Pioneer VTRs – including the professional MII format – and Control-L type applications. But it appears there will be no EX for Sony VTRs for a while, which seems odd as there are so many Sony decks in both broadcast and industrial use.

I should point out that if you wish to use more than one external device you'll need to add more serial ports to your Amiga. There are a number of multiple serial port peripherals available, including Commodore's own A2232 card.

SHUFFLE

Shuffler is a visual management system for manipulating a



Just some of the many features which go to make up the state of the art *Scala MM200*

NEW FEATURES IN BRIEF

- EX Modules for controlling external hardware
- SHUFFLER for pictorial manipulation of presentations
- SNAPLOAD for faster disk loading
- WIPES – more picture wipes and text transitions
- OUTLINE FONTS – supports WB2 outline fonts
- SOUND – now supports MIDI, SMUS, Soundtracker and GVP DSS modules and IFF samples
- AREXX support and scripting
- RECORD TIMING for mouse controlled presentation timing
- BUTTONS – improved button controls
- UTILITIES – for faster anims and script sorting

heights

presentation, an alternative to *Scala MM200's* standard List Editor. When Shuffler is in use a grid of thumbnail images will be generated from all the pages that *Scala* is currently using in the presentation, somewhat like a traditional storyboard. By dragging a thumbnail to a new location on the screen a corresponding change will be made in the presentation.

The display grid is user-definable, from 3 rows of 3 images to 14 by 8, with thumbnails being scaled to fit accordingly, so it is possible to see up to 112 thumbnails at once. All parts of the presentation are shown, not just the images, so it's possible to see at a glance just how everything is laid out, including music and other ingredients.

SOUND

Scala MM200 can utilise several different types of Amiga-generated sound files. *Soundtracker* modules can be played back directly, as can SMUS files and GVP DSS files, or IFF sound samples can be triggered as required. Sound files can be synchronised with page reveals or other functions to add a new dimension to desk top presentation.

AREXX AND LINGUA

Although *Scala MM200's* use of script files is not new, its ability to also save them in an ARexx format definitely is.

Couple this with *MM200's* ARexx port and it becomes possible to communicate with other software from a *Scala* script, substantially increasing the power of the program.

The beauty of having access to a text version of a presentation script is that it can be edited with a standard ASCII word-processor or editor, providing yet more flexibility.

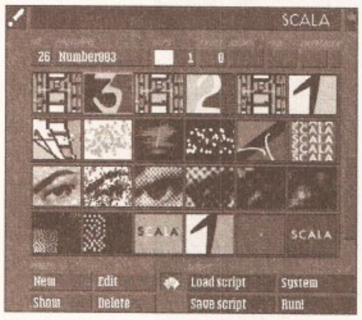
By the way, the *Scala* language has recently had a slight name change – from Lingo to Lingua – though don't ask me why.

THE NAME GAME

In a flurry of recent name changes Digital Vision, the makers of *Scala*, have renamed themselves 'Scala', while *Scala 1.13* becomes *Scala Video Studio VS113*, and the budget *Scala 500* is renamed *Scala Home Video Titler HT100*.

OUTLINE FONTS

If you use WB2, *Scala MM200* can make use of its two native Bullet fonts and, after a little delay, scale them smoothly to your chosen sizes. If you have any Agfa Compugraphic fonts you can also use these after converting them to Bullet format with the WB2 Fountain program. The advantages of using such scalable fonts is that, unlike bitmapped fonts, they don't suffer from the jaggies when scaled up to larger sizes. Of course, *Scala* MM200 still supports all the normal Amiga fonts and Colorfonts, as well as having its own 3-level anti-aliasing to add extra smoothness where necessary.



The Shuffler screen makes changing a presentation very simple – just click and drag any mini-picture around to change the running order

AND THERE'S MORE...

What else is new? Well, the Buttons functions have been extensively overhauled so that making screen hotspots is even easier and more powerful than before. A selection of powerful new wipes has been added, as well as a crawl function for moving a line of text horizontally across the screen, though some of the new wipes really need 2Mb of chip RAM to function correctly. It is now possible to link lines of text together on a page and apply the same transition to all of them simultaneously, though, unfortunately, large text can stutter a bit with certain line transitions.

A new Record Timing function has been added so that presentations can have their timing set interactively by using the mouse, which means that graphics can be accurately controlled to tie in with music, speech or simply tweaked to best advantage.

Animation handling has been improved, and animations larger than the Amiga's available memory can be loaded from hard disk and played glitch free – though an accelerator and fast hard drive are recommended for the best results. Of course, if enough memory is available it is possible to pre-load files automatically for instant recall when needed. This really worked a treat on my 10Mb Amiga when I set up an animation 'juke-box'. After a short delay for loading around 8Mb of animations from hard disk, playback was virtually instantaneous. I was well impressed!

In order to improve animation playback speeds a utility called AnimLab has been provided. This converts standard Anim5 format animations into one of two proprietary *Scala* formats and the subsequent playback speed increases really are noticeable – though at the expense of slightly larger file sizes.

Additionally, Animlab can make animations from a series of frames, split animations up into frames, or convert PAL animations to NTSC and vice-versa. Using AnimLab isn't mandatory though – most animations will run just fine without conversion.

AND MORE!

Scala presentations can now include branching commands which will execute either an ARexx script, another *Scala* script or run a program from the Workbench or CLI before resuming the presentation.

There are numerous other minor additions and improvements – better text editing, the use of variables, better interface, and faster handling, for instance – all of which help to make *Scala MM200* a joy to use.

Mind you, I'm not happy about everything. One thing I particularly miss is being able to make a stand-alone graphics presentation for distribution on disc, since the new *ScalaMMPlayer* requires a hardware 'key' be present on the target Amiga.

Scala MM200 has come a very long way in a relatively short time. The basis of the program is now said to be complete, though there are a few minor bugs yet to be fixed, and future work will be channelled towards new and improved EX modules, more fonts, additional backgrounds and so on. And, heaven forbid, there might even be an EX for a serially-driven coffee machine to serve the audience at the end of another successful, all-singing and dancing, *Scala MM200* presentation.

WHAT IS MULTIMEDIA?

Multimedia is a buzzword that's been around for some time, but it's one which seems to have been adopted (and adapted) by different manufacturers for their own ends.

As far as I can see, multimedia is about integrating diverse audio and visual sources to produce a coherent performance or product under the control of a host computer. This could involve computer-generated graphics, animations, text, speech, music and other sounds, CD audio, videotape, laserdisc, still video cameras and 35mm slides, MIDI-equipped music equipment, genlocks, vision mixers, and even comms hardware.

Of course, the Amiga has always been well-placed to take advantage of multimedia, and indeed there have already been a number of programs which have allowed control over external devices – including Gold Disk's *ShowMaker*, Commodore's own *AmigaVision* and, of course, *Scala*, whilst also giving full access to Amiga-generated media such as graphics, sound and animation.

SHOPPING LIST

Scala MM200 ....£395 plus VAT
by Scala

Upgrade for registered *Scala 1.1* owners
£119 including VAT.

Available from Scala UK Ltd,
Mill Studio, Crane Mead, Ware,
Herts, SG12 9PY
☎ 0920 444294

CHECKOUT SCALA MM200

Documentation ●●●●○
Generally excellent, with lots of tutorials and information, but with quite a few typos and a bit of confusion thrown in for good measure.

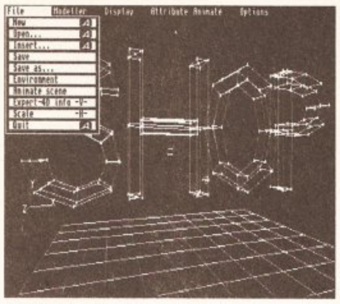
Features ●●●●●
Packed to the gills – backgrounds, fonts, wipes, drivers, ARexx, and too many others to mention here.

Accessibility ●●●●●
Makes multimedia production a pleasure – and you don't need a degree in computer science to use it.

Price Value ●●●○○
Destined for (and aimed at) the professional user, the price reflects the quality and depth of *Scala MM200*.

Overall rating ●●●●●

Scala MM200 is going to be difficult to beat. If there's a piece of software which will sell Amigas to the professional multimedia user, this is it.



With its simple user interface *Expert 4D Jr* could hardly be accused of being cluttered

THE FOURTH DIMENSION

Expert 4D Jr will model and render 3D objects – for under £40. Gary Whiteley examines it from all the angles

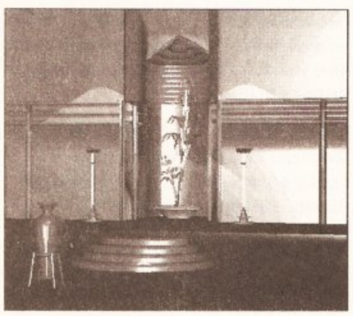
As a long-time user of Amiga 3D modelling programs I've worked with all kinds of different software, from early packages such as *Videoscape* and *Sculpt 3D* through *Silver*, *Turbo Silver*, *Imagine*, *Lightwave* and *Real 3D*. I've also checked out others such as *3D Professional*, *Draw4D*, *RayDance* and *Caligari*. Some I've loved, some I've hated, but most I've found at least some innovation in. *Expert 4D Jr* is no exception, though I'd have to hesitate to say that I *like* it.

Expert 4D Jr is a budget 3D product which consists of two main modules: a modeller for constructing the objects which make up a scene, and a renderer to turn the scene into 2D images or animations.

There's also a picture viewer for those without another alternative, such as *Dpaint IV*. But the bulk of the work is carried out in the modelling module, so that's where I'll start my mini-tour...

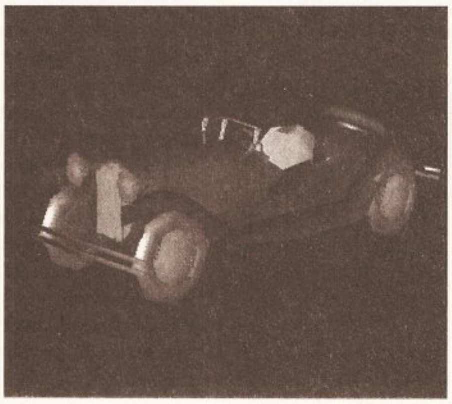
E1 – THE MODELLER

The choice of a 3D modeller is a very personal thing. Some I like, some I loath. *Expert 4D Jr's* modeller (known simply as E1) falls in between – it has some nice touches, and some real let-downs. In common with almost all modellers, *Expert 4D Jr* provides both Primitive and point-based construction methods. Primitive construction, the simplest way, uses basic 3D forms such as spheres and planes as building blocks for larger objects. Point construction, which is far more suited to building intricate objects, lets you draw a point-to-point outline and then extrude or spin it into a brand new shape.



Another of the *Expert 4D Jr* demos. I wasn't that impressed

The objects themselves are shown as wire frames in 3D space. By moving individual parts around and glueing them together new objects can be made. One of the nicer things about the modeller is that objects can be selected and manipulated at will – rotated, resized and moved – by dragging out a box around the chosen article(s) and then using the grab boxes provided to make the desired changes. A numerical indicator shows where and how your object is being transformed, but there is no way to enter the absolute co-ordinates for the action you wish to take – which is a pain if you're trying to be accurate. Another plus is that both points, and the edges which join them together, can also be pulled around as you wish, so deforming objects can be quite easy. I missed being able to snap points accurately to a defined grid though.



Don't let your eyes deceive you. This car might look nippy but it took around 30 minutes to render this fairly simple scene – even with a 40MHz 68030 accelerator!

Objects can have their colouring and surface settings (Matt, Shiny, Metallic or Plastic) defined, as well as having smoothing (Phong shading) on or off, but there are no fancy textures, and no chance of making the infamous chequered floors so beloved of novice modellers.

A scene is created by placing the objects, and up to 10 definable light sources, as you want them to appear in the final pictures.

By producing several scenes with variations in object positionings a series of 'key frames' are produced. When transferred to the renderer they form the basis for generating your animation.

E2 – THE RENDERER

So, you've saved your scenes and want to generate an animation. What now? Enter the Renderer module. Then load the scene, decide on the rendering mode (wireframe, polygonal or pixel) and resolution (up to hi-res, and including HAM), position the ambient light, set to 'record' and GO! A new screen pops up with information on what's happening, and the rendering begins. Depending on exactly what you're rendering and how many frames you're doing, you could be in for a considerable wait, possibly several hours or more.

Oh, I almost forgot! If you're rendering an animation there is an additional setting which sets the interval (in frames) between each key frame. What this means is that between every key frame *Expert 4D Jr* will automatically do the 'inbetweening' and generate the images to link the positions of objects from one key to the next.

THE VERDICT

In scientific circles the fourth dimension is generally reckoned to be time. With *Expert 4D Jr* time seems to mean time *warp*, as the rendering times are often very slow! On the positive side, at least *Expert 4D Jr* multitasks, so your Amiga won't be held captive while a picture is formed. Incidentally, while the program isn't designed to support accelerators, I was really glad to have my GVP 40MHz 68030 card to speed things along. To give you an idea of the rendering speed of *Expert 4D Jr* I did a trial with a very simple object – a Phong-shaded, shiny sphere of about 6cm diameter with 320 x 256 HAM resolution, at the best detail setting. It took around two minutes with the '030 and around five minutes without, which in my experience is rather appalling. Translate these times into complex scenes such as the Roadster demo provided (30 accelerated minutes) and you'll realise that overnight rendering (or an accelerator) is a must, especially if you intend making animations with *Expert 4D Jr*.

For very simple animations and non-critical rendering applications *Expert 4D Jr* may well satisfy the needs of the novice. Its heart is in the right place, and in some respects it is an improvement over some of the older 3D programs. But I'm afraid it is still far from the "irreplaceable tool for graphics in the art or advertising worlds" which the manual would have us believe.

Requirements: Any Amiga, at least 1Mb RAM (3Mb recommended), 2nd DD or HD useful.

SHOPPING LIST

Expert 4D Jr £39.95
by Genisoft Ltd
Genisoft Ltd, Unit 3, Poyle 14, Newlands Drive, Colnbrook, Berks, SL3 0DX
☎ 0753 686000

CHECKOUT EXPERT 4D JR

Documentation ●●●○○
Too little and too vague.

Features ●●●○○
A little short-handed, by current standards.

Quality ●●○○○
Sluggish – at best.

Price Value ●●●○○
Budget price, and some budget features.

Overall rating ●●●●○

Some interesting aspects, but I found *Expert 4D Jr* counter-productive, slow and somewhat lacking in finesse, though the price could make it attractive to the novice.

SURF'S UP!

Moving fluids have always been difficult to animate – until now. Gary Whiteley navigates the highs and lows of Powerwaves 3.1

Some years ago, frustrated at the lack of an easy way to make a series of rippling water objects for *Videoscape 3D*, I decided to try and write an Amiga BASIC routine to calculate and construct the necessary 3D files. I realised that I had to be able to change certain parameters to give me more flexibility and that as far as possible the production of the objects should then be automated. I worked hard, but not being a regular programmer, I only got about halfway there, even after a lot of struggling. But I learned a lot in the process, so it wasn't a complete washout.

Evidently there were similar plans being hatched in Italy and, unlike my efforts, these began to bear fruit, eventually leading to the release of the third version of *Powerwaves*, cunningly titled *3.1*, which I'm going to tell you about now.

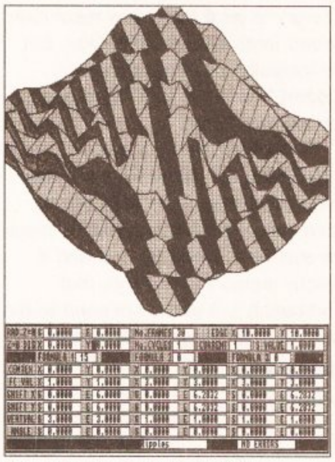
FLUID POWER

Powerwaves 3.1 is designed to produce a range of 3D objects which are, not surprisingly, based upon waveforms: moving liquids, flags blowing in the breeze and so on. The variety seems to be almost infinite, since the user is able to manipulate a host of parameters which all affect the way the waveforms turn out. By specifying the waveform characteristics, how many frames it takes to complete the wave cycle, and what format to save the results in, a sequence of 3D objects is produced which can then be imported into a suitable 3D rendering programme. Alternatively, a series of 2D frames can be rendered from the data and then turned into an animation with a program like *Dpaint*.

Powerwaves 3.1 works with just about any Amiga setup – WB1.2, 1.3 and 2.0 – and can make full use of an accelerator, if one is available. The manual says at one point that the program needs at least 330K of chip RAM and 128K of fast RAM, so it will even work on Amiga 1000s (as long as they have at least 512K of memory) – though elsewhere it states that 1Mb of RAM is required. Hard drive installation is reasonably straightforward – drag the icons from the disk into a new drawer – and replace a couple of libraries if you have an accelerator. There's a flaw in the Install library routine which means you have to do it by hand, or edit the disk name in the batch file to correspond with the *Powerwaves* disk name.

SWIMMING IN TREACLE

Powerwaves is not at all difficult to operate, though the parameters menu can be intimidating at first. The object here is to set up all the relevant details which control the number of frames, the number of cycles that the waveform goes through, the offsets of the X, Y and Z axis centres, the scale of the object sequence, the level of surface detail (or smoothness, if you like) and, most importantly, the style of the waveform. With 40 waveforms to choose from, and the possibility of mixing up to three different ones together to make a totally new hybrid, there's plenty of scope for experimentation. Anything from small ripples to massive great troughs and ridges can be constructed. By adjusting the speed of change with the cycling and frame number parameters the flow can be adapted to represent anything from water to cold treacle. To make choosing the waveform easier a small programme called *Visualiser* lets you display an animated wireframe representation of each of the 40 various formulae in turn, which is actually a great help when you get stuck.



Don't be intimidated by the control panel – there's a lot of wavepower hidden in there

OLD 3D STYLE

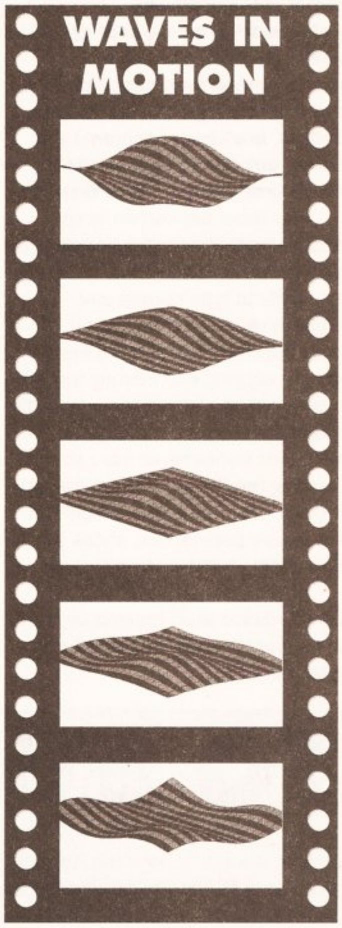
As for saving the waveforms as 3D objects, *Powerwaves* offers two possibilities: *Sculpt 3D* .script and *Videoscape* .geo files. It says on the nifty pop-up requester that it also supports *Imagine* format, but these turn out to be .geo files, which is a disappointment. It is possible to save the complete sequence as a series of objects, or just do a one-off save of the currently displayed frame. As the likelihood is that many users have now forsaken either *Videoscape* or *Sculpt* for *Real 3D*, *Imagine* or other more recent programs then the only way to use the objects generated with *Powerwaves* is to convert them to your preferred format by using a program such as *Pixel 3D* or *Interchange*. This could obviously cause additional expense, though regular 3D'ers will probably already have one of these immensely useful programs already. *Real 3D* users can always take advantage of the Sculpt-Real converter which comes with their software.

When it comes to using the objects in an actual animation *Sculpt4D* users have a slight edge because *Powerwaves* includes a CLI program called *MakeTake* which, as far as I can make out from its Italian readme file, is designed to make a .Take file from the sequence of separate objects which *Powerwaves* spits out. Other programs require that each object in the sequence is loaded into its own frame before rendering, which can be a real pain with a program like *Imagine*, though this isn't *Powerwaves'* fault.

AND FINALLY

What else is there to say? Well, there are three render modes for showing what your wave objects look like in 2D: wireframe, solid wireframe and coloured solid, the latter being blue and grey checks. Solid representations help to show how an object will deform over time, and are probably more useful than normal wireframes, which can sometimes seem confusing. Any parameter combinations that are particularly pleasing (or not, for that matter) can be saved for later recall.

Whilst *Powerwaves* is certainly not perfect I reckon that as it stands it should more than fulfil the waveform-generating needs of most 3D modellers. Hopefully a new version might support more 3D formats. Use *Powerwaves* to make flags, undulating surfaces, waves and other related objects. Add surface mapping and textures from your 3D program and it's possible to get some very lifelike ray-traced results from *Powerwaves* objects. At £17.95 it's not too expensive either, particularly as it isn't one of those pieces of software that you'll use every day.



SHOPPING LIST

Powerwaves 3.1
by UGA Software £17.95
Distributed by Database Direct Ltd,
PO Box 2, Ellesmere Port,
South Wirral, Cheshire L65 3EB
☎ 051 375 1275

CHECKOUT POWERWAVES 3.1

Documentation ●●●○○
Sparse, but readable.

Features ●●●●○
Does what you'd expect.

Price Value ●●●●○
Seems reasonable enough. Try programming it yourself!

Overall rating ●●●●○
Nothing else does what *Powerwaves* does, even though it isn't perfect.

Oh my *word!*

Wordworth 2 promises more fonts, more page formats and lots more features than ever before. Jeff Walker puts it to the test

W*ordworth 2* is much more than just a 'word processor'. It enables you to format your documents professionally, incorporate graphics, create an index and table of contents, mail merge, and print out at extremely high quality. Letters, leaflets, books; monochrome and colour; dot matrix and PostScript – *Wordworth* can cope with them all.

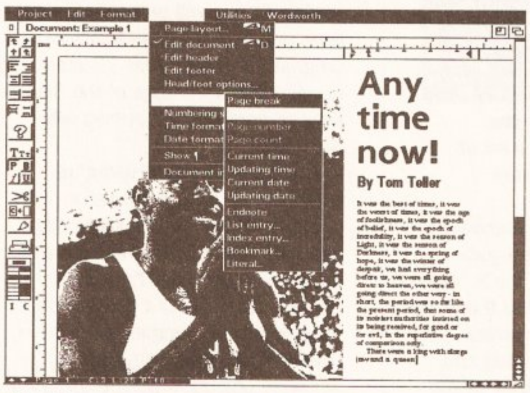
Now there are certain word processing features that you take for granted: obvious facilities, such as the ability to type normal and 'alternative' characters on the keyboard. Then of course there's cutting, copying and pasting blocks of text, within a single document and between multiple documents, automatic wordwrap to save you pressing the [Return] key at the end of every line, and those simple but undeniably popular text styles of plain, bold, italics and underline.

Wordworth can do all this commonplace word processing stuff, so we won't waste time going into detail about it.

Instead, let's dive right in at the deep end and take a look at *Wordworth's* support for fonts.

THREE-PRONGED ATTACK

Wordworth is a WYSIWYG word processor – What You See Is What You Get – so the font you use on the screen looks just like the font that gets printed. The first version of *Wordworth* supported Amiga bitmapped fonts and many fonts that were resident inside particular printers; version 2 also supports AGFA Compugraphic fonts.



32 columns per page mean that very sophisticated layouts are now possible with *Wordworth*.

First a few words about Amiga bitmapped or 'screen' fonts, because the way *Wordworth* uses these has changed. It used to employ some scaling-up-and-down wizardry to print these low resolution screen fonts at high resolution, but the inclusion of Compugraphic support has made this 'Ultraprint' feature redundant.

Wordworth now supports ColorFonts, the same kind of many-coloured bitmap fonts that *Deluxe Paint* can use. One is supplied, more are available. Workbench 2 and 3 directly support ColorFonts, but Workbench 1.3 users will need to run the ColorFont program that comes with *Deluxe Paint* – it isn't supplied with *Wordworth* itself.

Amiga bitmapped fonts, including ColorFonts, will print out at their low screen resolution – in other words, with jagged edges. If you want high resolution text output of screen fonts you use the Compugraphic 'outline' fonts.

Wordworth 2 comes with a good selection of Compugraphic fonts. There's Palacio and Benguiat Book, two serif fonts that are good for body text; Shannon Bold, which is good for headings; Univers Medium and Univers Medium Condensed, handy for subheadings; the non-proportional typewriter-like Courier for any text where every character needs to be the same width; a fancy serif font called Goudy Handtooled, ideal for leaflets; a couple of script fonts, Park Avenue and Signet Roundhand, that emulate handwritten text and are good for invitations and the like; four maths symbols and three dingbats symbols fonts; plus IBM PC versions of Courier and Benguiat Book that contain the standard PC line and box drawing characters.

That's an impressive 18 Compugraphic typefaces all told.

FONTASTIC VOYAGE

By default these fonts are kept in *Wordworth's* own Intellifont directory, and file sizes range from about 60,000 bytes to more than 200,000 bytes. So you can see that if you are working from floppies you can only get a few fonts on a disk. *Wordworth* will allow you to use multiple Intellifont disks, but the manual suggests that you create a few disks that contain just the fonts you want to use in a particular document, and stick to just the one disk for that document. This should avoid the problem that if you have this font on this disk, that font on that disk, another font on another disk, and then use all three fonts in one document, you'll be forever swapping disks like crazy.

Hard drive owners won't suffer from this problem, of course, as they can create the one Intellifont directory and put everything in there.

The Compugraphic fonts that come with Workbench 2 can be

TO BUY OR NOT TO BUY...

I think it's fair to say that buying a word processor is a major purchasing decision for most home Amiga users. Just like a car or stereo system – or a computer for that matter – it's something you'll want to buy once, and then use until it wears out.

Now, if you buy a car without a sun-roof, you can't expect to be able to open the top in the summer. But you would have thought about this before you bought the car. You would have decided whether you wanted a sun-roof, found out how much extra it costs, and then made up your mind whether to pay for it or not. Similarly, if you buy a stereo system that doesn't have a CD player, you can't go back to the shop afterwards and complain that it doesn't play compact discs.

"Aha!" I pretend to hear you cry, "but I can fit a sun-roof later when I can afford it, and, if I want one, I can also buy a separate CD player and hook it into my stereo system."

Yes, you can. But if you buy a word processor that doesn't do what you want it to do, you can't buy just an extra little bit of a program to make it do what you want it to. No, you have to buy another complete word processor, or wait (and wait and wait...) and hope (and pray) that the developers will upgrade your existing software.

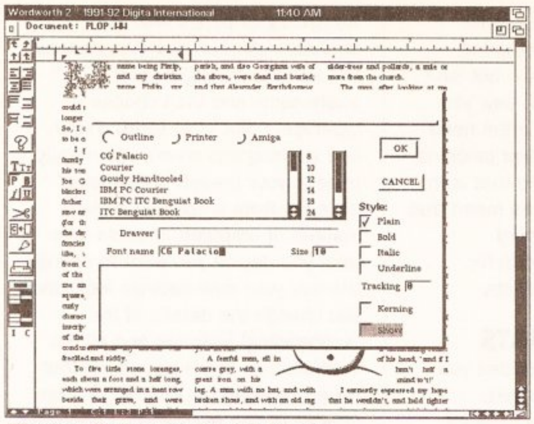
FOOLS RUSH IN...

So, don't hurry your purchase. Think about your word processing requirements, investigate what you can afford, and then buy your word processor.

And you shouldn't be fooled by fancy looks or extravagant claims. Many's the mug who has bought a second-hand car because "it's nice and shiny and got a lovely clean engine that goes like the clappers" – only to discover two weeks after buying it that the steering rod's bent, there's a hole in the floor, and that it drinks more oil and water than petrol.

Along with what you want to do with your word processor, you have to consider your system set-up. If you are considering buying a word processor that says it requires 3Mb of memory, and you've only got 2Mb, then you have to add the cost of 1Mb of memory to the cost of the word processor. If the word processor is really powerful and comes on umpteen disks, and you've only got a single disk drive, then you'll have to consider buying at least one more floppy drive, or perhaps even a small hard drive for ease of access.

All this should be thought about before buying the word processor. After two weeks or so of intensive use, it's usually too late to complain that you are sick of swapping disks or that you keep getting "Out of memory" messages – you should have bought another word processor that didn't demand such heavy 'system requirements'. But keep in mind that this will almost certainly mean compromising on features.



***Wordworth 2* supports high quality AGFA Compugraphic fonts, at sizes from 4 to 800 points**

used. All that needs to be done is to copy the '.type' files from the 'FONTS:_Bullet_Outlines' directory into *Wordworth's* Intellifont directory, and then run the supplied AGFAInstall program which updates *Wordworth's* font list.

The Compugraphic fonts used by Gold Disk products, and those converted from Adobe Type 1 with Gold Disk's *FontManager* program, can also be used – you need to copy the '.lib' files into the Intellifont directory, run the AGFAInstall program, and away you go.

If you don't fancy duplicating every '.lib' file in your CGFonts directory, then you can set a *Wordworth* Tool Type that makes the program look in a specified place for its Compugraphic fonts. If the file ends in '.type', '.typ' or '.lib', *Wordworth* will recognise it as a Compugraphic font definition file and start using it as such.

Floppy users can do all this as well, but the process isn't quite so simple as you need to make up lots of special disks. The manual guides you through this process.

CHANGING YOUR STYLE

The Compugraphic fonts work with Workbench 1.3, Workbench 2 and Workbench 3. Any size from 4 to 800 points can be used (about 1/18th of an inch to about 11 inches), and the standard styles of plain, bold, italic and underlined can be applied to any of them. So, for instance, by applying the bold style to the Shannon Bold font, you get a Shannon BoldBold font. Italics are created by simply slanting the font, and the result of applying the italic style to a font isn't the proper italicised font. For instance, applying the italics style to Times results in a slanted Times Roman font, which in all honesty looks nothing like the proper Times Italic font.

For proper styles you need the proper typefaces, but the bolding and slanting *Wordworth* does should be more than good enough for all but typesetting perfectionists.

Compugraphic fonts use a lot of memory. *Wordworth* itself now requires at least 1.5Mb, and if you are going to use Compugraphic fonts a lot then another 1.5Mb, making 3Mb in total, is very likely to be needed.

If you want an ultra-fast spelling checker and thesaurus as well, achieved by dragging the dictionary drawer into the RAM disk, then we're talking about a minimum of 4Mb. If on top of this you want multi-page documents that incorporate lots of coloured pictures, we're up to 5Mb and more, 2Mb of which had better be chip or 'graphics' memory.

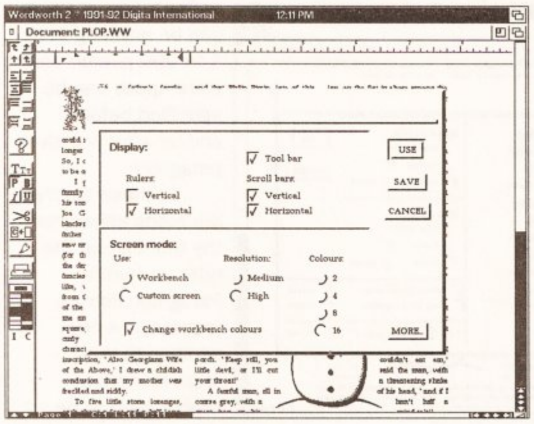
DOWN MEMORY LANE

Remember that not only do Compugraphic fonts and coloured graphics take a lot of memory to display on the screen, but they take even more when you want to print them, especially at high resolution.

Wordworth is unrivalled in its support for printer fonts – those fonts that are built into printers when you buy them. The advantage of using printer fonts is that they print very much more quickly, and they use very little of the Amiga's memory. The disadvantages are that you are restricted to the one, two or however many fonts that are inside the printer, that they can only be printed in a few small sizes, and that you cannot mix printer fonts and pictures in the same document.

Nevertheless, there are many occasions when it will be much more sensible to use a printer font than a Compugraphic font. Currently *Wordworth* claims to know about the internal fonts of 172 models of printer, including the HP DeskJet 500 and LaserJets; Canon bubblejets; Epson LQ-1000 and LQ-2500 fonts; EscP2 (the new Epson scalable fonts); Amstrad LQ-3500; Kyocera 'F' series; NEC P6 and P2200; Panasonic KXP-1124, KXP-2123, KXP-2180, KXP-4420 and KXP-4450; and Star LC models.

The *Wordworth* installation process asks you to pick out your model of printer from a list of more than 400, and the correct fonts and printer driver are installed for you.



***Wordworth* will run in medres or hires, on the Workbench or on a custom screen, in 2 to 16 colours**

MIXING AND MATCHING

Chopping and changing between printer fonts in your document is a simple matter of highlighting text and selecting the required font from the list. There are no restrictions: you can use all of your printer's internal fonts on one page if you like, provided, of course, that *Wordworth* has screen equivalents.

But you can't mix printer fonts, and Compugraphic/Amiga fonts in the same document. In fact *Wordworth* is intelligent inasmuch as it will look at the currently selected print method – Normal, Internal Printer Fonts or PostScript – and will not let you select a type of font that cannot be printed using that printing method. So if the Normal (or what used to be called 'graphics') printing method is currently selected you cannot use printer or PostScript fonts, only Compugraphic or Amiga fonts; if 'Internal Printer Fonts' is selected, *Wordworth* will only let you use printer fonts. The same applies for PostScript, for which you can select any of the 'classic 35' PostScript fonts.

A small point here. *Wordworth* supplies a Helvetica Narrow PostScript screen font, whereas some PostScript printers use Helvetica Condensed. These two fonts are not the same: they have different widths (and, of course, different names), so PostScript printers with Helvetica Condensed will lose the use of three faces – the plain, bold and italic versions of that font. Perhaps Digita should consider supplying a Helvetica Condensed as well?

GRAPHIC EXAMPLES

Wordworth's graphics facilities are nothing special. But there are enough features to enable you to spruce up your documents with plenty of pictures and diagrams.

Those features haven't changed much from version 1. The IFF-ILBM file format is supported, of course, from 2-colour up to HAM (4,096 colours), but 24-bit support is not yet implemented (they're working on it). Support for PCX, BMP and Encapsulated PostScript (EPS) graphics has been implemented, although the latter format cannot be displayed on-screen and can be printed only on PostScript printers.

Any graphic you load gets converted to the same number of colours as the current screen mode. If you're working in 4-colour mode and you load a sexy HAM picture, don't expect the result to be worth looking at on the screen. Nor when printed, because *Wordworth* prints exactly what's on the screen.

To use and print multi-coloured pictures you need to work in 8-colour or 16-colour mode. *Wordworth* converts the palette and is able to change colours 4-16 of its own palette to those used most in the graphic. If you load another graphic that has a different palette, then you can ask *Wordworth* to use this new picture's palette, but then the colours in the previous graphic will get altered to the new ones, which will make it look really weird.

There is a Remap facility which will attempt to build a compromise palette. Sometimes this works well, particularly for monochrome output, but on the whole you end up with two bad pictures instead of one good one and one bad one.

WORDS AND PICTURES

So, to use coloured graphics in *Wordworth* properly it's best to create them all with the same palette. Basically, you should experiment to work out the 8 or 16 screen colours that print best on your printer, and stick to those.

For monochrome printouts you could use *Deluxe Paint* or a graphics conversion package to convert all your pictures to the same 16 shades of grey. And with black-and-white clip art there is no colour conflict problem, of course.

Wordworth is able to run text around a graphic: either the vertical left or right edge of the whole graphic. Alternatively, the background colour (colour 0) can be set to transparent so that text can run around the contours of the drawing. The distance inserted between the graphic and the text – the 'standoff' – can be altered to suit.

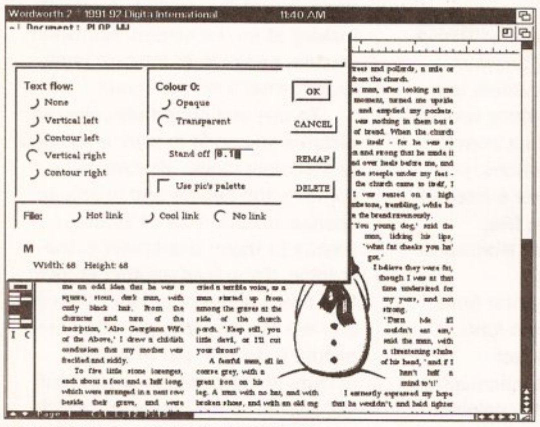
The only new additions to the graphics facilities in version 2 are the file links. Here you have three options: hot, cool, or no link.

No link means that the graphic will be loaded as normal, converted to as many colours as the current screen mode allows, and saved permanently within the document.

The magic happens when you select the button that creates a hot link between the document and the graphics file. The file is loaded, converted and displayed as normal, but when you save the document the

Wordworth screen image of the graphic is discarded and only the path and filename of the graphic is saved. Upon loading that document again, *Wordworth* will first load the document, then trundle off and look for the graphic and load that.

Can't see the point? Ah, come here, there's more. Say you load the graphic into *Wordworth* and you



'Hot links' mean that any changes made to a graphic are automatically updated in *Wordworth*

suddenly see that it's not quite right. Normally you would have to delete the graphic from the document, run a painting package, load the graphic, alter it, save it, and then re-load it into *Wordworth* again.

Wouldn't it better if you could simply leave the graphic where it is in *Wordworth*, run the painting package, alter the graphic, save it, and have it automatically re-load into *Wordworth*? Yes it would, and that's what the hot link does.

It doesn't require ARexx, nor does it require the painting package to have an ARexx port or any other special feature, nor does it require any other special third-party software. It does require Workbench 2 because this 'hot links' feature is something that has been built into the new Amiga operating system. Surprisingly, not many developers know about it – *Wordworth 2* is one of the first products to use it.

HOT PROPERTIES

You don't have to multitask for the hot link to work. If you've used a particular graphic in a *Wordworth* document and some time later you decide to alter that graphic, then the next time you load *Wordworth* and the document the 'latest version' of the graphic will be loaded – provided that you saved it with the same path and filename after altering it. If a graphic is not saved as part of an actual document this would have happened anyway, of course. I'm merely pointing put that it doesn't matter if you do it that way.

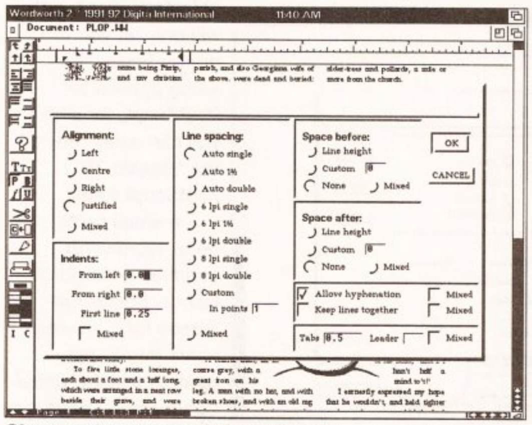
However, if you change the path or filename, or delete the graphic, then *Wordworth* will not be able to re-load it and you'll end up with a document with no picture. You'll have to re-load it manually, unless of course you've deleted it, in which case you'll have to draw it again. Serves you right for being so stupid.

The cool link is like the hot link in that the graphic is not saved as part of the document, but this time any changes made to the graphic while multitasking a painting package with *Wordworth* will not be automatically reflected on the *Wordworth* screen after saving it. Of course, if you change a cool-linked graphic and save it with the same name, the next time you load the document the changed graphic gets loaded with it, just as with a hot-linked one.

THE WAY TO LAYOUT

Wordworth's layout and formatting features revolve around a couple of requesters, a few tools in the tool bar, and the horizontal ruler.

The Page Layout requester contains six sizes of paper: A3, A4, A5, US Legal, US Letter, and Wide Tractor, plus a Custom button which



Changes to paragraph formats can be made in this requester, from the tool bar, or on the ruler line

allows you to enter page sizes up to 29.5 by 29.5 inches. (Measurements can be specified in inches, centimetres, picas, points, pixels, 10-pitch, 12-pitch and 15-pitch.) Here you also enter your margin dimensions, including those for headers and footers. A Facing Pages option enables you to have mirror-image margins for left-hand and right-hand pages.

The Columns gadgets are new additions to version 2. You can specify up to 32 columns, plus the 'gutter' distance that should placed between each. These are 'snaking' columns, newspaper style – all the way down one, then up to the top of the next, and so on.

This arrangement is fine for certain applications – designing newsletters, for instance – but isn't particularly convenient if, say, you are writing a script, and often need to switch between adjacent columns. This may not be a feature that is in mass demand, but it does mean that there are better Amiga word processors than *Wordworth* for writing and formatting scripts.

WELCOME FORMATS

With your page layout decided you can begin to format your text.

Every paragraph may have its own format – a paragraph being the text between two carriage returns. With the text cursor sitting anywhere in a paragraph, margin, indentation and tab setting changes made on the ruler affect that entire paragraph. By dragging a block over more than one paragraph, changes can be made to chunks of text, or, of course, the entire document. A paragraph format can be copied and applied to another paragraph or block of paragraphs.

The details of a paragraph format are quite sophisticated. Left and right indents can be set, plus a special left indent for the first line of a paragraph; left, right, centre and decimal tabs can be placed on the ruler with a click of the mouse; justification can be left, right, centred or flush; line spacing can be anything from 1 to 999 points; and extra space can be specified before and/or after any given paragraph.

All these settings are made either from the tool bar, on the ruler, or from a Paragraph Format requester. A new addition to this requester allows hyphenation to be selected or deselected for each paragraph. *Wordworth* now uses the Proximity Hyphenation System for improved accuracy (well, that's what it says here). But you still can't create an exceptions dictionary, nor specify how many letters of a word must be together on a line before a hyphen is allowed, or how many lines on the trot may be hyphenated.

Ah yes, and there is now a rudimentary 'widows and orphans' feature that, when selected, will ensure that paragraphs are not split over page breaks.

PLAYING WITH TAGS

The font, style and colour of the text does not form part of the paragraph format. From a desktop publishing point of view these details would normally form part of a style format or 'tag' and help to speed up the formatting of things like subheadings. For example, instead of having to highlight each subheading and then choose a typeface, point size, style, colour, line spacing and so on, you merely choose your preset 'subheading' style tag from a list: two clicks instead of umpteen. If some time later you decide you want to change the way your subheadings look, then you change the details of the 'subheading' style tag and all the subheadings in the document that have that style tag applied to them change in one fell swoop. I hope this is a feature Digita will consider for a future version.

There has obviously been some thought along these lines because changes to the Find and Replace requester now allow you to search for text that is set in a particular typeface in a particular point size and change it all to another typeface in another point size. A small step in the right direction.

Further changes have been made to Find and Replace so that you can now search for special codes in the document – things like tabs, carriage returns, text styles, dates, or times.

TAKE A BREAK

Page breaks can be entered in order to force text on to the next page. Similarly, column breaks can be used to force text into the next column.

A special code for the page number and page count can be entered into the header and/or footer, but not in the document itself. Page count is the total number of pages in the document, so you can have something like "Page 3 of 15" at the top or bottom of each page. There are five numbering styles: ordinary numbers, uppercase Roman, lowercase Roman, uppercase letters, or lowercase letters. The starting page number of each document can be specified, allowing you to have the chapters of a book as separate documents while preserving the correct page numbers.

There's an option to have different headers and footers for even and odd pages, but you can't change the text in a header or footer part way through a document. The first page of a document can be printed without headers and footers.

The current time and/or date can be entered anywhere in the document, header or footer, and so can an updating time and/or date. This 'updating' option means the time and date printed is the time and date at the time of printing as opposed to the time and date at the time of writing. There are five time and 10 date formats available.

Endnotes (notes that get printed at the end of the document) are now supported but not footnotes (notes

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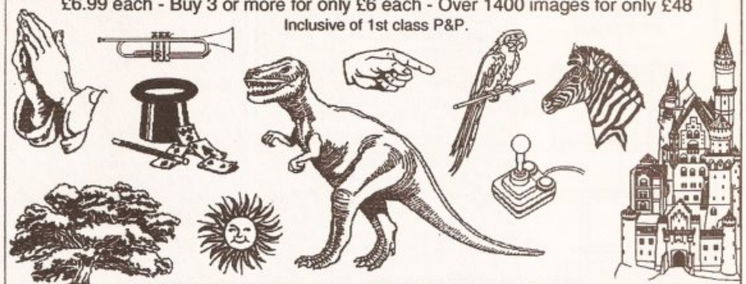
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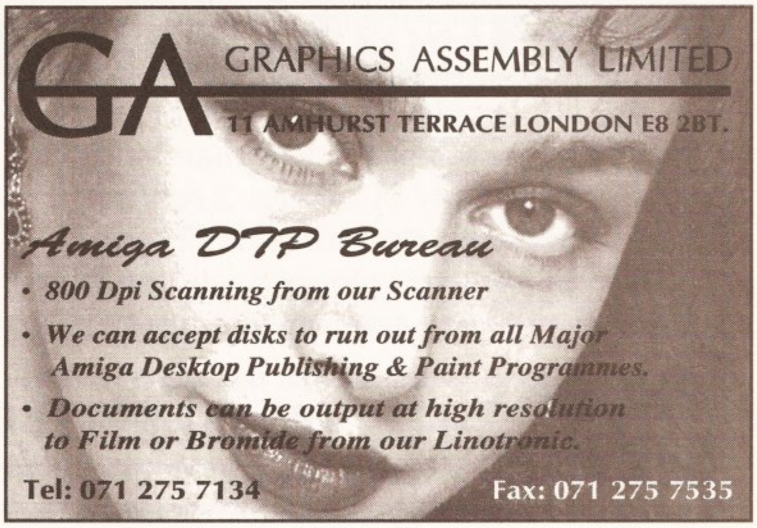
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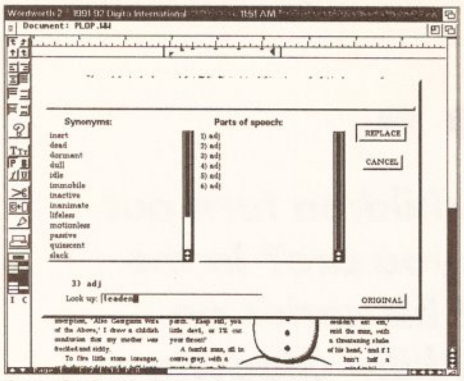
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Annoyingly, the huge non-draggable thesaurus requester won't allow you to see your word in context

that get printed at the foot of the same page as the 'notable' text). Endnotes are numbered from 1 to N for each document, so you can't have many separate chapter documents and have a whole endnote section at the end of the book. You'd need to have an endnote section at the end of each chapter instead.

Endnotes are marked in the text by a raised number in the same typeface and size as the current font. It's up to you to make sure the line spacing is great enough to allow room for the raised number.

For easy reference, the Goto requester now allows you to jump to any endnote or named bookmark, as well as a specific page number.

TURNING THE TABLES

Two welcome new features are the ability to create indexes and tables of contents.

Index markers can be inserted as you type, or you can finish writing and then go through marking entries later if you like. There is a facility to include every occurrence of the marked word or phrase in the index, and along with the main index entry you may have two subentry levels.

Before actually creating the index you can specify whether you want every single page number to be listed next to an entry, and whether there are consecutive page numbers or not. Alternatively, you can tell it to use page ranges, so that if an index entry is on pages 3, 4 and 5 the numbers will appear in the format "3-5" instead of as "3,4,5".

A table of contents can be generated in much the same way, complete with sub-levels.

The thesaurus has changed since version 1. It's now the Collins one that has 30,000 entries and 826,000 cross-references. On the whole *Wordworth's* thesaurus is a pleasure to use, but the bleedin' great requester obscures almost the whole of the screen so you can't see your word in context. Digita says it will address this problem, probably for the next upgrade.

The spelling checker is the same as before, the Collins/Merriam-Webster 137,000-word version. Words can be easily added to and deleted from a single user dictionary. If I was being really picky I'd have to say that a lacking feature is the ability to create specialised user dictionaries and tell *Wordworth* which ones to use while checking spelling. I'd also like to see a 'batch' spelling mode, allowing the spelling checker to go right through a document checking all the words, and then present me with a list of dubious spellings at the end of checking the whole document, rather than having to correct each misspelt word as it finds it.

The spelling checker will pull you up if it finds the same word typed twice in a row – a common typo – but it does not check to make sure that the letter following a full stop and one or more spaces is a capital letter, another common error.

PRINTS CHARMING

After writing and formatting your document, you'll want to print it.

Version 1 of *Wordworth* featured a print requester that had so many buttons on it that it could have held its own among the knobs and levers in the Science Museum. But no longer, thank heavens.

Printing is much simplified. Three methods are available: Normal for Compugraphic and Amiga fonts and anything that has pictures in it; Internal Printer font; or PostScript.

The printer driver can be always be selected from the Setup requester, which is handy if (like me) you tend to print to a number of different printers. This saves you mucking about with Workbench Preferences. Density and Smoothing can also be selected, plus black-and-white, Colour or Grey printing, and continuous or cut sheet paper.

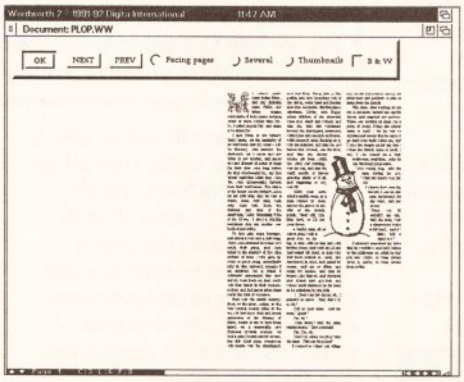
A new feature is the Print Border. This is for printers that impose their own margins (top, bottom, left and/or right) in order to feed the paper in or out, or, like laser printers and inkjets, to prevent toner or ink from being sprayed into the printer's innards. Once these Print Borders are set up for your particular printer (from details gleaned from the printer's manual) *Wordworth* will not let you set physical page margins that conflict with them.

This feature should help enormously with one problem a lot of beginners have – the top line of multi-page documents being printed progressively lower down the page. But of course you'll only notice an improvement if the Print Borders and on-screen page size and margins have been set up correctly.

QUALITY CONTROLS

Print quality with the new Compugraphic fonts system can be excellent, but is necessarily dependent upon the quality of your printer. In other words, you shouldn't expect high quality printouts from a 9-pin printer – at least 24 pins are required. Printouts from 300 or 360 dots-per-inch inkjets and laser printers look superb. Having said that, whatever printer you have, using the Compugraphic print method and the Density set to 7 you are always going to get the highest quality printouts that your printer can possibly manage.

Turboprint Professional and Citizen Print Manager owners will be especially pleased to hear that *Wordworth* works perfectly with those programs, enabling you to enhance the output of pictures as well as text.



***Wordworth 2's* Page Preview has been speeded up with the addition of a black-and-white mode**

PostScript support is rudimentary, but adequate for word processing. Output is monochrome only, and can be sent to a printer or a file. There are rotation, scaling and offset gadgets, plus the ability to send a Ctrl-D end-of-file character should your PostScript device require it.

FURTHER FEATURES

Wordworth is a big program, and there's still quite a lot I haven't got space to go into detail about.

Mail merging, for instance, now offers conditional merging facilities. The Page Preview mode has been improved, with a new, quicker, black-and-white mode. The icons in the tool bar have been made a bit smaller so that more tools could be added. Also new is the Glossary, *Wordworth's* equivalent of 'macros', whereby you can feed whole chunks of commonly used text into a Glossary requester. From there it can be placed into any document at the click of a button.

Wordworth really is a smashing word processor. It's always nice to look at and sometimes stunning. Fun to use, powerful when you need it, helpful when you're stuck. But unobtrusive when all you want to do is bash out words.

Version 1 had perhaps fallen behind the pace slightly, but version 2 has put *Wordworth* a good length clear of the field.

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CHECKOUT WORDWORTH 2

Ease of Use ●●●●○
There's a lot to learn and some of the specialised functions are by their nature quite complex, but the manual explains everything in plain English.

Features ●●●●○
New additions include Compugraphic font support, multiple columns, indexing and table of contents generation, AA chipset support, bigger thesaurus, and support for PCX, BMP and EPS graphics formats.

Speed ●●●●○
In use, a bit faster than the previous version, and perfectly usable on a 68000-based Amiga in 4-colour mode. Be warned that printing an A4 page using outline typefaces at high resolution can take half an hour on a 68000-based machine. This is not *Wordworth's* fault, it's simply how long it takes the 68000 CPU to convert the outline data into a bitmap that a dot matrix printer can print.

Documentation ●●●●●
Superb 350-page manual. Easy-to-follow tutorial; excellent chapter on typography; comprehensive sections on printing with fonts and graphics; lots of useful reference material and troubleshooting in the appendices.

Price Value ●●●●●
You get a lot for your money, including 60 days' free technical support direct from Digita themselves.

Overall rating ●●●●○

Wordworth 2 is currently the most feature-packed word processor for the Amiga. But bear in mind that it needs to be used in hires mode to be seen at its best, and Compugraphic fonts are slow and awkward to use from floppy.

GO parent...

What if your children turn out smarter than you are? In the fourth part of his series on artificial life, Philip Gladwin shows how intelligence evolves from one generation to the next. PLUS: the final installment of the virtual cockroach program

So far in these articles we've been following the progress of Gene, a simulated cockroach, as he struggles to find food in his simulated forest. This month, in the final part of the series, we'll see how the individual components of his mind slug it out in a process remarkably like natural selection. Plus we'll be able to watch the 'intelligence' which Gene needs to find food evolving out of what was a completely chaotic beginning.

SEE THE TREE FOR THE WOOD

If you dig out the tree diagram I gave you last month you'll see there are big two areas of the program left to cover: ***Procedures GENETIC*** and ***GRAPH_RESULT***.

> **"...the individual components of his mind slug it out in a process remarkably like natural selection."**

The first thing to notice about ***GENETIC*** is that it only happens with a percentage of 25%. If it is called more frequently rules don't have time to adjust their strengths according to their merits before they are involved in genetic operations. If it is called any less then the time taken by Gene to learn anything seems to rise dramatically.

The first section of code within the procedure selects one of the pieces of information about the world Gene owns. In other words, it picks a classifier from Gene's rule base – we'll call this rule R1. To do this, the code uses a probability directly related to the rules' strengths. The strongest rule is most likely to be picked, but it's not absolutely certain that this will happen.

THE MECHANICS OF MATING

Next a decision is taken, again using probabilities, as to whether this selected rule will be 'mated' with another member of the knowledge base in a process of cross-fertilisation, or whether it will just be be reproduced and its clone inserted back in. If it is reproduced then it is copied and the copy simply replaces another rule, again selected completely at random.

If, however, R1 is to be spliced with another rule then ***Procedure CHOOSE_X_OVER*** picks the splicee, R2, with probability according to strength, from the subset of the classifiers that have the same action as R1. ***Procedure X_OVER*** then splices R1 and R2 together to produce, we hope, a new super rule. A cut point is chosen at random, and the offspring, R3, is built out of the parts. R3 is added to the rule base, and a classifier is deleted.

Figure 1 explains the mechanics of the splicing action. Most of the time both R1 and R2 will be kept as well as R3, and so the child will go into direct competition with the parents. Better children (that is, those which obtain the largest rewards) should become stronger than their parents and eventually drive them out, whereas poor children should soon weaken and lose their own places.

Random Splicing Position

```
1010|110011101010
                      Parent Strings
0001|110101010111

1010|110101010111
                      Child Strings
0001|110011101010
```

Figure 1: Two mating bit streams caught in the act!

THE MECHANICS OF SWAPPING GENES

To mate two strings line them up, and, using a randomised method, select a point somewhere along the string. The sections of the strings to the right of that cut-off point are exchanged to produce two new strings.

One of the new strings contains the bits of the first string up to the cut-off point plus the bits from the second string beyond that cut-off point. The second child contains the other combination (see Figure 1).

These children are then inserted into the community in place of another string. This means that the size of the population remains the same, while the quality slowly increases.

Another way to mimic the effects of the background mutation found in the real world (which I didn't include in the program) would be to introduce some method of very small random change such as flipping every 10,000th symbol from 0 to 1 or vice versa.

While this won't be sufficient to push the community in any particular direction, it will supply enough background noise. Just as in the 'real world', this will help to make sure that the population doesn't become too uniform or rigid, incapable of further development.

Well, there you have it. That's all the code that makes Gene do what he does – all that remains is to look at how we know what Gene does.

GENE'S GRAPHICAL PROGRESS

As the program runs we can get a vague measure of how well Gene is doing by simply sitting back and watching him wandering around in the wood. Amazingly enough, this can get a little bit tedious by the 500th repetition – and it does take that many cycles for something really significant to develop in a rulebase. ***Procedure GRAPH_RESULT*** tackles this problem in a brilliant and subtle way – it draws a graph. More precisely, it draws a graph which plots the average number of steps taken per food problem, over the last 50 problems.

The wood that Gene finds himself in is quite a friendly wood – he is never more than 4 steps away from food, and if he were as intelligent as you or I, the average number of steps he would need to get to the nearest bit would be only 2.39. On the other hand, if you were simply to wander around the wood completely at random, then the average number of steps you would take per problem is more like 32.12.

> **"Better children... become stronger than their parents and eventually drive them out..."**

We want Gene to be as clever as we can make him, so we are aiming at getting his score down as close to the human average as we can. The line traced on the graph (as shown in Figure 2) is a good illustration of just how well he is doing. And I think you'll agree, if you study the graph for a moment or two, that Gene really does rather well.

Starting at the random average of 32.12 Gene quickly learns a thing or two and gets this average down to below 10. From then on his average cycles between 6 and 12 – the upper limits are presumably when one or two of his better rules were deleted before they had time to reproduce properly. But I still reckon that his final performance isn't bad, especially when you take into account the fact that he started life as a random mess of 0s and 1s!

> **"We are aiming at getting his score down as close to the human average as we can..."**

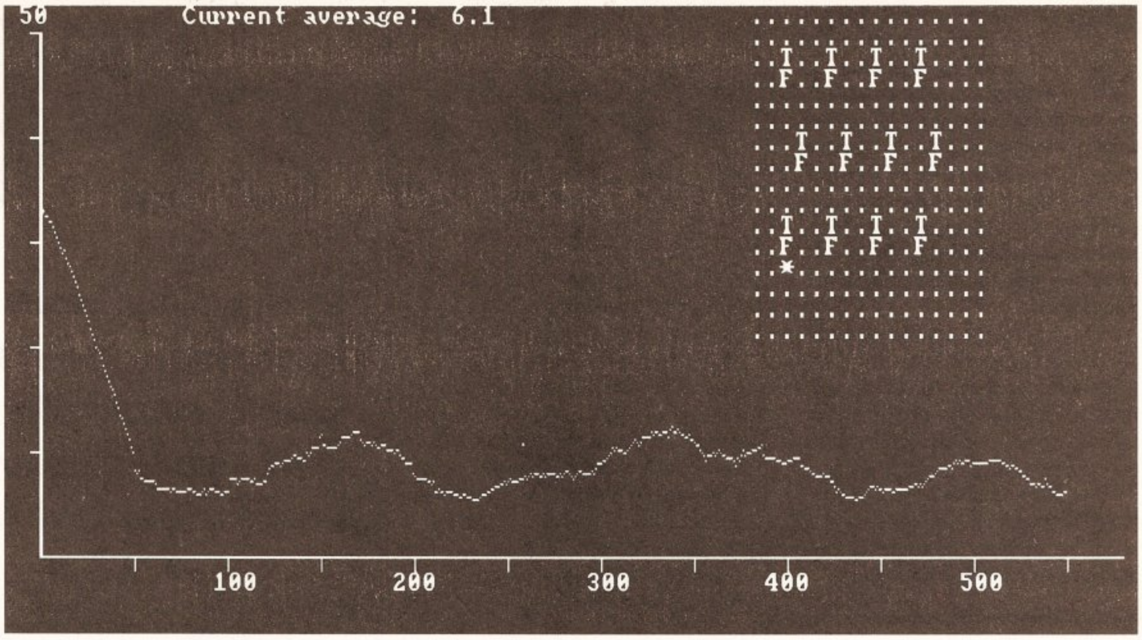


Figure 2: The line on this graph indicates Gene's gradual progress towards 'intelligence'. *Mastermind* here we come!

WRAP-UP TIME

I have to thank Stewart Wilson, whose paper *Knowledge Growth in an Artificial Animal* provided the intellectual backbone for the series and the algorithm for the program. All mistakes are, naturally, mine and not his. And that's it for this series – I hope you've enjoyed it. If you have, and you want some more of the same, then all you have to do is write and tell *Amiga Shopper*.

GENETIC ALGORITHM PROGRAM – PART 3 • GENETIC ALGORITHM PROGRAM – PART 3

```
'__________________
' GENETIC ALGORITHM ↵
PROGRAM PART 3
' Type in after last ↵
month's listing
' AMOS
' Philip Gladwin
'__________________
Procedure
CHOOSE_X_OVER[CLASSIFIER]
   Shared SPLICE(),PERCENT()
   For I=1 To 110
      PERCENT(I)=0
   Next I
   For I=1 To 40
      If
Mid$(RULE$(I,2),1,1)=Mid$↵
(RULE$(CLASSIFIER,2),1,1)
         If I<>CLASSIFIER :↵
Rem don't let it pick itself
            SPLICE(I)=1
         End If
      End If
   Next I
   ' Work out combined ↵
strength of rules that can ↵
be spliced
   S_STRENGTH=0
   For I=1 To 40
      If SPLICE(I)=1

S_STRENGTH=S_STRENGTH+STR↵
ENGTH#(I)
      End If
   Next I
   '
   PTR=1
   For I=1 To 40
      If SPLICE(I)=1

STR=Int((STRENGTH#(I)↵
*100.0)/S_STRENGTH)
         If STR>0
            For J=1 To STR

PERCENT(PTR)=I
                  Inc PTR
               Next J
            End If
         End If
   Next I
   Repeat
      RTN=PERCENT(Rnd(99)+1)
   Until RTN>0
End Proc
Procedure GENETIC
   Shared PERCENT()
   '-Select classifier ↵
according to strength
   For I=1 To 110
      PERCENT(I)=0
   Next I
   ' Work out combined ↵
strength of P
   P_STRENGTH=0
   For I=1 To 40

P_STRENGTH=P_STRENGTH+STR↵
ENGTH#(I)
   Next I
   PTR=1
   For I=1 To 40
      STR=Int((STRENGTH#(I)↵
*100.0)/P_STRENGTH)
      If STR>0
         For J=1 To STR
            PERCENT(PTR)=I
            Inc PTR
         Next J
      End If
   Next I
   Repeat

MAIN=PERCENT(Rnd(99)+1)
   Until MAIN>0
   'Classifier selected
   If Rnd(1)=0
      CHOOSE_X_OVER[MAIN] :↵
Rem splice the rule with ↵
another one:
      SECOND=Param
      X_OVER[MAIN,SECOND]
   Else
      'copy the classifier ↵
randomly into the rulebase
      POSITION=Rnd(39)+1
      RULE$(POSITION,1)=RUL↵
E$(MAIN,1)
      RULE$(POSITION,2)=RUL↵
E$(MAIN,2)
   End If
End Proc
'
Procedure GRAPH_RESULT
   Shared AV()
   '
   If FIRST_TIME=0
      For I=1 To 50
         AV(I)=32.12
      Next I
      FIRST_TIME=1
   End If
   AV(CYCLE_COUNTER)=WALKED
   For I=1 To 50
      TT#=AV(I)+TT#
   Next I
   AVERAGE#=TT#/50.0
   Y=(4*(50.0-AVERAGE#))+10
   Ink 5
   X=Xgr+1
   Plot X,Y
   Locate 8,0 : Print "   ↵
 Current average: ↵
";AVERAGE#;"    "
End Proc
'
Procedure MAKE_OLD_A
   For I=1 To 40
      OLD_A(I)=0
      If A(I)=1
         OLD_A(I)=1
      End If
   Next I
End Proc
'
Procedure
X_OVER[MAIN,SECOND]
   '
   X=Rnd(15)+1
   Y=16-X

HEAD$=Left$(RULE$(MAIN,1),X)
   TAIL$=Right$(RUL↵
E$(SECOND,1),Y)
   ACTION$=Mid$(RUL↵
E$(MAIN,2),1,1)
   POSITION=Rnd(39)+1
   RULE$(POSITION,1)=(HEA↵
D$+TAIL$)-" "
   RULE$(POSITION,2)=ACTION$
   '
End Proc
```

PUZZLED BY THOSE SYMBOLS?

Because of the width of the columns, we occasionally have to break a listing across two or more lines. Where this has occurred and you enter two or more lines without a [Return] between them, we've used the following symbol ↵ Watch out for these symbols when you're typing in one of our listings – or you could spend a long time looking for ↵ on your keyboard!

more FUN

In the final part of the series, Cliff Ramshaw gets stuck into a real world example of multitasking and shows how it can be an invaluable aid to productivity

This month I'm going to demonstrate just how much of a boon the Amiga's multitasking abilities can be. I'm going to outline the sort of task that might well be encountered in the real world and show how it can be made so much easier, and performed that much quicker, by having several programs running at once, working in conjunction with each other.

I'm a journalist, so the example I'm about to give you is the kind of thing that I am likely to run into, but I think you'll be able to see how the same principles would apply to your own projects. So here's the brief:

Our brave and noble journo has been commissioned to write an article on fractals. It's to be aimed at people who can already program,

> **"...the likes of PCs use a form of multitasking kludge known as a 'Terminate and Stay Resident' program"**

with a view to outlining the principles of writing fractal algorithms. Of course, no article on fractals would be complete without a goodly selection of screen shots.

The conventional method would be something like as follows. First our journo would be more than likely to boot up his word processor and start writing his introduction. After a while he'll need to write some programs, both to test that his examples work, and to produce his screen grabs. So he must save his work (he did have a blank formatted disk prepared, didn't he?) and quit from the word processor. Then he needs to boot up a suitable programming language and get cracking with some code.

GETTING SHOT

Once the programs are working they can be run and some screen shots produced. Getting some screen shots can be pretty awkward. The easiest way is to run a screen grabbing program in the background, and use this to create IFF format pictures of the screens created by the fractal programs. This would be impossible without some form of multitasking (the likes of PCs use a form of multitasking kludge known as a 'Terminate and Stay Resident' program). If he didn't have this, there would be two alternatives: one is to modify the programs so that they save their screens as IFF files – how easy this will be will depend on the program language chosen – or to use a rather more expensive piece of digitising equipment.

Assuming that our hero finds some way of getting the screen shots, he then has to load up his word processor once more and continue writing.

If at any stage he realises he's forgotten to include something in one of his programs then he has to quit out of his word processor, load up his programming language and make his adjustments. Then he has to run them again, get a new set of grabs, load up his word processor and make the necessary changes to his text... you can see what a hassle it could all turn into.

As you probably know, fractal programs, especially Mandelbrot or Julia set generators, take an awfully long time to run. During this time our journalist can do nothing but drink cups of tea. It's a waste of time.

LOOKING DIFFERENT

With a multitasking operating system, things look quite different. Things begin similarly enough: the journalist boots his word processor and begins to write, probably beginning with a headline and some sort of introduction.

Being a sensible sort of chap, he then decides it's time to save his work. He digs out a floppy disk from his collection and puts it in the drive. If he's unlucky, the disk will have a virus on it, and he stands to lose all his work. Fortunately, he's got *Kill Da Virus* running in the background, so he needn't worry.

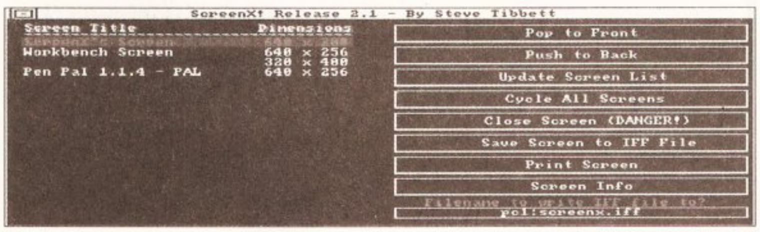
Next he needs to format the floppy so he can fit all his work on it. Rather than going through the rigmarole of quitting from the word processor he simply clicks on the swap screen gadget at the top of its screen and returns to the Workbench. From here he can open a Shell and format the disk. He can leave the format program to its own devices and switch back to his word processor to write a little more text. When the disk has been formatted

> **"...you can see what a hassle it could all turn into."**

he can save his text and continue writing with a sense of security.

Once our hero gets into the nitty gritty of his subject he'll probably want to start programming to test out his ideas. Now he could quit out of the word processor at this stage, since he's not going to be using it for some time, but there's really no need. Besides, leaving the word processor in the background will save a certain amount of loading time when it's needed later on.

So Amiga Basic, for example, is loaded up, and our journalist begins coding. Once he's got his programs working (a lengthy process at the best of times), it's time to get some screen shots. No problem! He loads up his copy of *ScreenX* – a handy little program that sits in the background until it is told that it is



Shown here is the excellent *ScreenX* utility, which sits in the background until its services are required. At this point it creates its own screen, from where you can choose to save out any of the screens present on the system

THINGS THAT WILL HELP

There's no question about it, to multitask effectively you'll need more than a basic Amiga.

For a start, you'll need plenty of memory. As the Amiga's operating system stands, all programs that are running at any one time must simultaneously be present in memory. You won't get away with running too many things at once with only 1Mb.

More complex systems, such as Unix, use a technique known as 'virtual memory', whereby programs can be swapped between a hard disk and memory nearly instantaneously, so that the machine appears to have much more memory than it actually does. Virtual memory hasn't yet been implemented as an official part of the Amiga's operating system, but it no doubt will be in time.

The other main requirement is a fast processor. When several programs are multitasking, the processor is constantly swapping between them, running one and then another so quickly that it presents the user with the illusion that they are running simultaneously. Clearly each program will run more slowly than if it were running by itself. There is also the small time overhead of swapping between programs. So, if you intend to do lot of multitasking, you'll need an accelerator too.

than one

required, at which point it will save any screen as an IFF file.

If it's a Mandelbrot generator then it will be some time before it produces any output worth grabbing. So instead of hanging around our journalist flicks screens back to the word processor and starts writing about the programs he's created.

> **"...more quickly than... on certain non-multitasking computers we could mention."**

He'll probably want to include segments of his code in the article. There are a few ways he could go about this. The first is to just type in the listings. This is both time consuming and dangerous, since he might make a typing error and all his readers are going to end up entering a program that just won't run.

Another method is to load the program files into the word processor and use its cut and paste facilities to insert segments of the programs into his document. If he's using Amiga Basic he's going to run into a problem here, since Amiga Basic saves its code in a non-standard format which will turn out as a load of gibberish on the word processor screen.

A SNAP OF POWER

Our journalist could switch back to the Amiga Basic screen and save his text as ASCII, or, if he's running a handy utility such as *PowerSnap* (it's on this month's cover disk – who says we don't look after you?) he could copy sections of code straight from the listings window and paste them directly into the word processor with no more hassle than a couple of mouse clicks and one or two key presses..

There'll come a time when one of our journalist's programs has finished producing its output. Again he clicks on the swap screen gadget at the top right and goes to the Workbench screen. Then he clicks with the left mouse button on *ScreenX*'s window to make it active. Clicking again with the right-hand mouse button will give him a list of possible screens to grab. He just has to click on the one he's interested in, give its file a name, and away *ScreenX* goes.

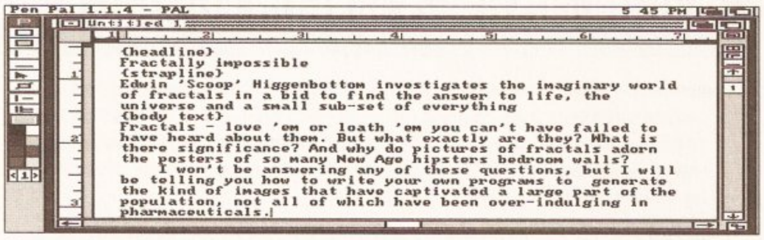
If he's using a reasonably sophisticated document processor such as *Pen pal*, he can load the picture directly into it and place it beside the relevant piece of text. He can now return to Amiga Basic and start another of his example programs running, or, if he's got plenty of memory to spare, he may well have been using several versions of Amiga Basic at once, each with a different fractal program running, in which case he can keep on writing while waiting for the next one to finish.

As the article he's writing comes together, our journalist may decide he's not entirely happy with the way his screen shots have turned out. He could, for example, be writing for *Amiga Shopper*, in which case they will all be printed in black and white. If he hasn't given careful thought to the colours produced by his programs, it could be that the screens they've produced have insufficient contrast to be clear when printed in black and white. Well, all he has to do is boot up *Deluxe Paint*, load each of the pictures in and adjust their palettes until the contrast is better. Then he saves them and re-imports them into his word processor.

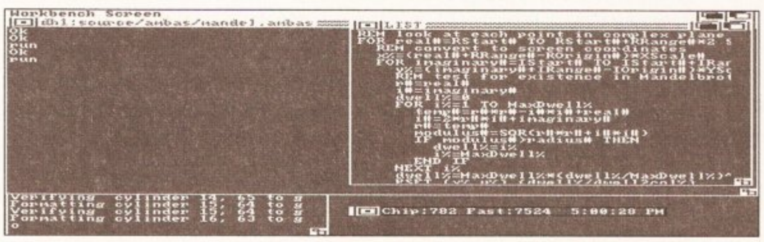
HOT LINKS

The latest generation of desktop publishers and document processors make this last process even easier. They include a facility known as 'hot links', whereby any files that are linked to a document can be modified by another program and the versions residing in the document will be updated automatically without any need to re-load them.

So, the job is finally done, much more quickly than it would have taken on certain non-multitasking computers we could mention. And all of this means he can take a well-earned break down the pub. Cheers, and happy multitasking! AS



Shown above is *Pen Pal*, running in its own custom screen. It's a document processor that can incorporate both text and graphics in the same document



This screen shows several of our journalist's programs running in harmony. Amiga Basic is in the foreground, ready to run a Mandelbrot generator. Behind that is a Shell window, in which the disk formatting program is running. Towards the bottom of the screen is *Kill Da Virus*, ever watchful, while *Pen Pal* is waiting for more text in a screen of its own

JARGON BUSTING • JARGON BUSTING

AmigaDOS – one of the most basic parts of the Amiga operating system – the collection of programs that take care of the general running of the machine. AmigaDOS concerns itself with device-handling: control of the keyboard, basic screen output, printers and so on.

ASCII – American Standard Code for Information Interchange. This is the data storage method commonly used when we type text files and enables data to be exchanged between different computers.

Basic – Beginners' All-purpose Symbolic Instruction Code is a high-level programming language, much favoured by microcomputer users. It combines a fair amount of power with ease-of-use.

Fractals – Patterns created by the constant repetition of a simple pattern at smaller and smaller scales. One example is a triangle with smaller triangles on each of its sides, with smaller triangles on each of their sides, with smaller triangles...

IFF – Interchange File Format is a means by which data from graphics or sound sampling programs are saved in a compatible way.

Multitasking – the ability of a computer to run more than one program at once. In practice, only one program is run at a time, with the others waiting for their turn. The part of the Amiga's operating system called Exec handles the switching between programs, which is done so quickly that they all appear to be running simultaneously.

Operating system – a constantly running collection of programs which control the basic operations of the computer, such as disk accesses, memory allocation and so on.

RAM – Random Access Memory, so called because any part of it can be accessed immediately, rather than having to search through from the start of memory to the point of interest. RAM is used to hold programs while they are being executed and temporary data. The contents of RAM are lost when the power is switched off.

Run – An AmigaDOS command which sets a program going as a background process, multitasking with whatever processes are going on in the foreground.

SAILING THROUGH C

In this month's tutorial: how variables enable your programs to deal with different situations. Cliff Ramshaw shows why C programmers always have 'something to declare'

Variety, it is often said, is the spice of life. Every programming language must be able to deal with varying circumstances. One of the key ways in which this is done is by the use of 'variables'.

Cast your mind back to last month's column, with the program that printed 'Hello world' to the screen. This printed text is constant – it never changes, no matter how many times the program is run. Programs that operate in this manner are very limited. Imagine, for instance, a program that added two numbers together, but which always used the same two numbers. It would be next to useless. What is needed is some way to make the program add together whichever two numbers the user requires.

Such a program could be broken down into three parts: the bit that finds out from the user which two numbers are to be used; the bit that adds these two numbers together; and the bit that tells the user the answer. It's a classic program structure: input data, manipulate data, output data.

Once the data has been entered by the user, the program itself needs some way to refer to it so that it can perform the addition. This is where variables are useful. Any data entered into a program is given a name – this name is the variable. Any future references to the name are then taken to mean the data that it represents.

Imagine a variable called 'fred'. We could assign the value 73 to it by means of the following piece of code:

```
fred=73;
```

If later in the program the printf function is used to output fred, what you will see on your screen is the number '73'. The reason variables are so called is because the data they refer to can be altered from within the program. We could write:

```
fred=fred+5;
```

which would add 5 to the previous value of fred. In this example, fred would then have a value of 78.

So for our program to add two numbers we will need three variables: two to hold the user's input and one to hold the result to be output. We'll call them 'first', 'second' and 'answer'.

> **"It's a classic program structure: input data, manipulate data, output data."**

In C, all variables must be 'declared' before they are used. This gives the compiler a chance to make space for all the data that will be used (since all data takes memory). It also helps prevent errors. If you initially declare a variable named 'first', but subsequently refer to it as 'fist' because of a typing error, the compiler will spot it. The error would go unnoticed in a language such as BASIC, which would treat 'fist' as a variable independent of 'first', causing subtle anomalies in the program's behaviour.

To declare a variable in C you must tell the compiler both the variable's name and its type. For now we'll be working with integers (whole, or non-fractional, numbers). Their type is designated as 'int'. Our three variables could be declared in the following manner:

```
int first;
int second;
int answer;
```

Now you could get a bit tired of typing 'int' every time. Fortunately, a shorthand way of writing this is provided in C. So long as all the variables are of the same type, then they can all be declared in one line, separated by commas:

```
int first, second, answer;
```

We now have the means to store our numbers and arrive at an answer to the addition. This answer will be sent to the screen by means of the printf function introduced last month.

Getting the data into the variables from the user is done by a function called 'scanf'. This is used in a similar way to printf, but has the opposite effect: printf displays stored information on the screen, scanf stores information taken from the keyboard. Scanf is conveniently present in the same header file as printf. So, the entire program now looks as follows:

```
#include <stdio.h>
void main()
{
    int first, second, answer;

scanf("%d%d",&first,&second);
    answer=first+second;
    printf("%d\n",answer);
}
```

The strange characters which appear within the quotes in both the scanf and printf lines are explained in the box on 'Formatting Strings' at the top

CHOOSING A COMPILER

There is quite a number of C compilers available for the Amiga. The package most professionals choose is SAS/Lattice C, available for £229 from HiSoft ☎ 0525 718181. This is a lot of money for a language that you are as yet unfamiliar with, and which you may not be sure is the one for you. It's far safer, then, to try something from the public domain. We recommend NorthC, a package which includes a linker, assembler and numerous examples. It's on PDOM disk 211. We got our copy from Public Dominator which can be contacted on ☎ 0279 757692. NorthC is now a charityware product. A lot of work has gone into it, and so we urge you to send £15 to the Spastics Society as the author Steve Hawtin requests.

JARGON BUSTING • JARGON BUSTING • JARG

Assembler – A program which converts an assembly language program written in words (well, almost) into the machine code numbers that the Amiga's 68000 processor understands. Writing programs in assembly language ensures that the best possible speed and memory efficiency is gained from the machine.

Compiler – A means of translating a program to render it understandable to the computer. A compiler translates the whole thing into machine code before it is run. The compiled program is generally much faster than its interpreted counterpart, but developing it will usually take longer, due to the time spent waiting for it to be compiled.

Editor – An editor, like a word processor, is a means of entering text into the computer. Programs are written with an editor before being turned over to a compiler or interpreter.

Executable object – A file which can be loaded into the Amiga and run as a program, as opposed to a data file which requires another program to give it meaning.

Interpreter – Another means of translating a program for the computer's convenience. An interpreter translates a program line by line as it is running, and therefore tends to be slow.

FORMATTING STRINGS

The C functions printf and scanf make use of the rather peculiar concept of formatting strings.

You may remember that last month I said functions in C require a set number of arguments. I also said that printf is an exception to this rule. The other major exception is scanf. The formatting string is the means by which these functions get around the rule and consequently achieve their power.

Not only do both functions take an indefinite number of arguments, these arguments can also be different kinds of variables depending on what needs to be input or output. The formatting string tells the function both what kind of arguments it is dealing with and how many of them there are.

A number of different character combinations can appear within the strings, corresponding to the types of variables to be dealt with. The only one we are interested in at the moment is the integer variable, which is represented by the '%d' characters.

If one integer is to be printed out, then the corresponding statement looks as follows:

```
printf("%d",number);
```

(The '%' sign tells the compiler not to print the 'd', but to print the number instead.) More than one number can be printed in the same statement by including formatting characters for each of them:

```
printf("%d%d%d",first,second
,third);
```

The same <$I>applies for inputting numbers using the scanf function. Different types of variables can be mixed with both printf and scanf – we'll deal with this case once the types of variables themselves have been discussed.

---

of this page. Another thing which you've probably noticed is that the variables first and second are mysteriously preceded by the '&' character in the scanf line. The reason for this is a little involved, and will be discussed later in the series. Suffice to say that whenever you use scanf to get a number from the user into a variable, you can take it as read that the variable's name must always be preceded by '&'.

If you type the above program into an editor and save it as add.c, then it can be compiled under NorthC by typing:

```
cc add.c
```

and once compiled it can be run by simply typing:

```
a.out
```

Now that we've dealt with addition, it's a simple matter to convert the program to handle, subtraction, multiplication or division. Change the line reading:

```
answer=first+second;
```

to one of the following:

```
answer=first-second;
answer=first*second;
answer=first/second;
```

Notice that the '*' is used to mean multiply, and the '/' represents divide. If you try compiling the dividing version of the program, you may notice some strange results when you run it. Because all the variables used are integers, no fractional answers will be given. The result of 6 divided by 4 will be given as 1. It has been rounded down to a whole number.

There is a way around this using a type of variable called 'float', which will hold numbers with fractional parts. We'll deal with these in a future installment.

COMMENTS PLEASE

One of the generally accepted rules of good programming practice says that you should always include

> *"Segments of code that appeared obvious will take on the aspect of propositions by Wittgenstein."*

comments in your programs. Comments are segments of text that appear in a program but are ignored by the compiler. They serve only as a reminder for you or as an aid to understanding for someone else when looking back over your code.

The above example seems simple enough, so comments aren't really necessary. But imagine the situation in which you've written a program over 100 lines long. Imagine that after a few months you've decided to go back to it and make some improvements. If there aren't any comments in there, you're liable to have a hard time trying to work out what the program is doing, and by what means. Segments of code that may have appeared obvious when you wrote them will take on the aspect of propositions by Wittgenstein.

And if you can't read your own source code, imagine how impenetrable it will look to someone who's never seen it before. Out in the real world, well-commented code can save both time and money.

Including comments in C source code is simplicity itself, so there really is no excuse for not putting them in. A comment is defined as anything included between the '/*' and '*/' symbols. So, taking things to an extreme, our addition example could be re-written as follows:

```
/* retrieve input/output
definitions from standard
library */
#include <stdio.h>

/* beginning of main program
*/
void main()
{
/* declare variables */
   int first, second, answer;

/* get numbers to be added
from user */

scanf("%d%d",&first,&second);
/* perform addition */
   answer=first+second;
/* output result */
   printf("%d\n",answer);
}
```

On the theme of readability, it's important to choose the names of your variables carefully. Many people would write the above program with variable names such as 'a', 'b' and so on. Not only does this suggest a lack of imagination, it's an invitation to confusion when these people come back to look at their code in the future. At least with names such as 'first' and 'second' you will have a fighting chance.

There are some restrictions on variable names in C. For a start, you can't use the 'reserved keywords' of C. These include words such as 'void', 'int' and several others that will be revealed in time. Furthermore, all variables must start with a letter. From then on in, both letters, numbers and the underscore character ('_') can be used. 'Alan', 'B128' and 'BX_23G' are legitimate names: '1Alan' and '_BX23G' are not. Case is significant for letters, so the variables 'A' and 'a' are distinct from each other.

Next month we'll be looking at some more types of variables, including those that can store text. We'll also be taking our very first look at simple looping – the technique which enables computers to carry out lots of similar operations with only a small amount of prodding. Until then, see if you can't come up with a few variations on our simple calculator program. AS

TING • JARGON BUSTING • JARGON BUSTING

Library – The Amiga has many special features, and programs are already present in the operating system to make use of these features. These programs, or library functions, may (and should) be used by applications programs, obviating the need for each programmer to write a similar set of routines.

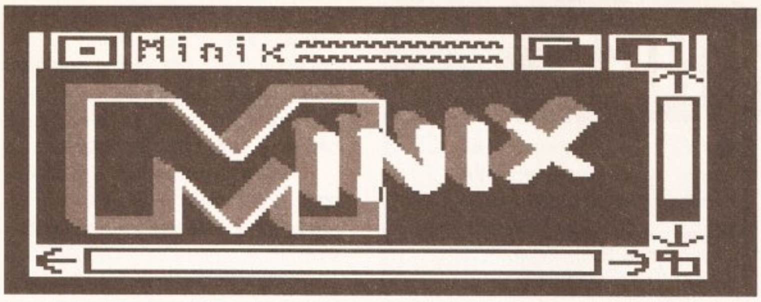
Linker – A program which joins together the various segments of code produced by a compiler, along with any relevant library routines, and produces a finished, executable program.

Object file – A runnable program: one which works without the aid of an interpreter.

Source code – A program represented as a text file and presented to a compiler or assembler for input. The output is known as object code.

Type – Describes the kind of information a variable is to hold. Before a variable is used it must be declared to be of a certain type – whether it is an integer, character, floating point number or a more complex user-defined type.

Variable – A method of storing information which may vary as a program runs. In C, each variable is given a name, and the information it contains can be accessed or changed by reference to this name.



The Minix loader icon won't win any design awards

YOU LITTLE MINIX!

If you're tired of AmigaDOS, why not invest in a whole new operating system? Angus Marshall tries out a new version of UNIX for the Amiga

UNIX is an effective resource-sharing multi-processing environment, and as such, it appears very similar to AmigaDos in terms of low-level functionality. This being the case, why should anyone want to switch from the Amiga's native environment to something developed 20 years ago, on a completely different machine?

Well, for day-to-day tasks, using Amiga applications, there really is no need to switch, but for anyone who needs to develop for several platforms, UNIX is rapidly becoming an industry standard. Despite the number of different flavours of UNIX currently available, they all descended from that first AT&T version, and have a great deal in common. Thus, with a little care, it is possible to produce software that behaves identically on a range of different architectures. Good examples of this are the *X-Windows* system, the *TeX* typesetting package, and just about any GNU package you come across. Furthermore, with extras like Sun's NFS (network file system) and the standard networking protocols it is possible to link UNIX systems from different manufacturers together to share disks, printers, tape streamers, comms links to the outside world, and more. Equally important, from my own point of view, is the fact that UNIX embodies a large number of important operating system concepts, making it an ideal example for teaching purposes.

In the Amiga world there are basically two choices for anyone who wants to run UNIX – Amiga Unix (Amix), Commodore's own version of System V Release 4 (SVR4) – or the version known as MINIX.

Amiga Unix was one of the first releases of SVR4 and is acknowledged to be a complete implementation with full support for networking, virtual memory and *X-Windows*. For the majority of Amiga users, however, it is just too large (needing at least 100Mb of hard disk, and preferably more than 200Mb) and expensive (around £860 plus VAT for a 2-user license). It also requires a 68020 or better, because of the need for a MMU (Memory Management Unit) to support paged and virtual memory operation.

MINIX, on the other hand, is in reach for a great many more Amigans. It costs around £150 (including VAT, unlimited users, and a free site licence for academic sites), and will run on all machines from an A500 upwards with at least 1Mb of RAM. Naturally, you don't get a full implementation of UNIX – VM is not supported, networking is quirky, and don't even think about *X-Windows* (though there are supposed to be two windowing packages available for MINIX: *MGR* and *Mini-X*).

WHAT IS MINIX?

Professor Andrew Tanenbaum was one of the academics who found it difficult to teach operating system concepts without being able to reference the UNIX source code. He wrote his own mini-UNIX, embodying most of the important features of UNIX, but in a smaller package suitable for micro-computers. The result was MINIX, released in January 1987. Since then it has undergone several revisions and has been ported to most popular micros including the Macinstosh, Atari ST, and our very own Amiga.

Indeed, MINIX has become so popular that a major publisher, Prentice-Hall, has taken on the job of distributing the system for the PC, ST, Mac and Amiga.

AMIGAMINIX

So, what do you get for your £150? In the standard Prentice-Hall distribution you should find:

- Nine system disks – one boot disk, one root file system, one /usr file system, two system binaries, one Kernighan & Ritchie (K&R) compatible C compiler, one operating system source code (compressed) and two commands source code (compressed).

- A 680-page manual giving instructions on how to install, maintain and re-build MINIX, along with descriptions and usage of over 175 utility programs (the commands), the C compiler and the editors (compatible with four popular UNIX editors).

Also in the manual is the complete source code for the PC version of MINIX, which, apart from really messy low-level stuff, is identical to all other versions of MINIX. If you really want to see the Amiga specific parts of MINIX, you can always uncompress the relevant sections from the supplied source code disks. Additionally, if you buy MINIX from the MINIX Centre, you should receive details of its support and update schemes, including MINIX versions of

A BRIEF GUIDE TO THE COMPLEX HISTORY OF UNIX

In the mid-1960s a team from AT&T Bell Labs, General Electric and MIT were working on a new operating system – to be called Multics – with the aim of providing efficient resource sharing to the greatest number of users possible. In 1969, AT&T decided that progress on Multics was unlikely to produce a working system within a reasonable period of time and pulled its team members out of the project.

This left it without a suitable operating system for their Research Centre.

Because of this, Ken Thompson and Denis Ritchie (both members of the original Multics team) and their colleagues sat down to design a new operating system to fill the gap left by the rejection of the Multics project. By 1971, they had a working prototype running on the infamous PDP-11 architecture, and it was known as UNICS (a play on the name Multics, reportedly devised by Brian Kernighan). It was while developing compilers for the new UNIX operating system that Kernighan and Ritchie created the B and, later, C programming languages. The whole operating system was eventually written in C.

Because AT&T was not allowed to sell computer products at this time it released copies of the new operating system, including the source code and development environment, to universities for educational purposes. Hence the popularity of UNIX spread and local variants were developed to cater for a wide variety of machines and situations. Unfortunately for us, as the popularity of UNIX grew, AT&T decided that it should restrict access to the operating system source code and, as of Version 7, it became impossible for universities to use UNIX source as part of their teaching programmes.

UNIX has also been split into two distinct streams: 4.x BSD originates from the University of California at Berkeley, where Version 7 was ported to the DEC-VAX architecture, while System V, now moving into the business world, was the result of AT&T's own modifications to Version 7. Both streams are slowly coming together again as the POSIX standard takes over.

some popular GNU packages, and upgrades to MINIX that are not supported by Prentice-Hall.

For those of us lucky enough to own Amigas with hard drives there is one minor problem. Prentice-Hall's AmigaMinix 1.5 does not support Amiga hard drives. This is decidedly inconvenient because, although it is possible to run MINIX from floppy there is a need to swap disks, especially since the system binaries are spread over four disks (six, if you include the boot disk and root file system). As for hacking the source code – forget it! The remaining three disks of the Prentice-Hall distribution are filled with compressed source files for the operating system and commands. In order to rewrite your favourite part of the operating system you need either a lot of RAM to use as RAM disk, or at least 10Mb of hard drive.

Notice I said that the Prentice-Hall distribution doesn't support hard drives? Fortunately, the MINIX team are active on Usenet and frequently post patches and revisions to ftp-sites and bulletin boards for interested parties to download. As far as AmigaMinix is concerned, the most important of these are the patches to upgrade from 1.5 to 1.5.10.1 and from 1.5.10.1 to 1.5.10.2. Not only do these bring in support for CBM's hard drive controllers, but they also add further features and fix bugs which caused problems with floppy drives.

One other thing: AmigaMinix binaries are compatible with STMinix

```
Booting Minix 1.5.10.2 Copyright 1991 Prentice-Hall Inc.
Insert ROOT diskette and hit RETURN (or specify bootdev)
Minor  Size (Mb)  Name
193    7          MS-Dos
194    0          MinixRoot
195    6          MinixMain
196    25         DH0
```

The Minix boot screen, waiting for the root image disk to be inserted

and vice versa – you can run the same programs on both without recompiling. As for other versions of MINIX, you'll find that they are source level compatible – in other words, a program written for one machine can be recompiled on another without changes (unless, of course, you're going in and hitting the hardware directly).

USING AMIGAMINIX

Starting AmigaMinix is simplicity itself. Either boot directly from the supplied boot disk, or double-click on the MINIX icon. After a few seconds' drive activity, the Amiga is impersonating an early-80s text-only UNIX system (which gives rise to my first quibble: if MINIX can run in a window on the Mac, why can't it do the same under Intuition?).

The first thing you see on booting is a request to insert the root file system disk, or specify a root device. This is because MINIX uses a file system very close to that of full UNIX implementations, allowing it to spread its directory tree across several volumes, without the user really knowing what is happening. Because files can be located on any correctly configured disk connected to the Amiga, a root file system, containing the links to the other file systems, is maintained on RAM disk and loaded every time the machine boots. This file system also contains just enough commands to get the operating system going without needing to link in the other disks immediately.

LOGGING OFF

Because MINIX is designed to run on personal micro-computers, it gives you a good feel for the way UNIX works, particularly since you're likely to be your own system manager. It can be very daunting at first, trying to get to grips with the more arcane features, and most users have problems with the 'two-fingered

```
196     25      DH0 3,194

Memorysize =  2940k  MINIX =  184k    RAM disk =   524k  Available =  2232k

RAM disk loaded

Checking zone map
Checking inode map
Checking inode list
blocksize =  1024     zonesize =  1024
      683    Regular files
       33    Directories
        0    Block special files
        0    Character special files
     1558    Free inodes
        0    Named pipes
     1112    Free zones
/dev/s610p3 mounted
/dev/s610p2 mounted

Sat Sep 5 16:03:03 1992
Welcome to MINIX - Trial System
Small hard disk on Amiga 2000HD with VXL-30

Console Login :
```

The Minix boot after /etc/rc has executed. Now it's waiting for a user login

typist' approach that came up with command names like 'cmp' (CoMPare two files), 'cp' (CoPy a file), 'mv' (MoVe or rename a file). Then there are the really wacky ones such as 'grep' (Global Regular Expression Parser) and 'bawk' (Basic AWK – Ahoe, Weinberger and Kernighan – named after its authors!). Yet on the whole familiarity brings confidence, and within a few weeks you should be qualified to read messages in comp.unix.wizards without feeling left out.

In use, I found AmigaMinix to be very stable, the only major crashes occurring when I modified the file system process to allow some normally forbidden actions, but no real damage was done. In terms of speed, it's a little stretched when supporting four virtual terminals and a serial terminal line on an A2000 with a VXL30-25 (no 32-bit RAM) , but nothing unbearable. With only one terminal on a bare 68000 performance is adequate.

The commands and utility programs supplied were comparable with their real-UNIX counterparts, with only a very few options missed.

SHOPPING LIST

AmigaMinix £150.00

Available on order from:
Most good bookshops or it can can be ordered directly from:
The Minix Centre, Forncett End,
Nr Norwich, Norfolk
NR16 1HT
☎ 0953 789345.

Amiga Unix (SVR4) is available from
Applied System Group Ltd.,
The Flarepath, Elsham Wold, Brigg,
North Humberside DN20 0SP
☎ 0652 688330.

HARDWARE REQUIREMENTS

AmigaMinix will run on an A500 with 1Mb of RAM and one floppy, but it is difficult to do any more than get an impression of the operating system under these conditions, especially since using the C compiler will be impossible. It booted successfully under Kickstart 1.2, 1.3 and 2.04 without any problems.

I strongly recommend that anyone thinking seriously about purchasing MINIX should get hold of the 1.5.10.x patches and the 1.5.10.2 demo disk enabling them to install MINIX on a hard disk. All Commodore hard drive controllers are supported (A590 XT and SCSI, A2090, A2091 and the A3000 controller) *except* the A600 IDE controller. Installation requires at least 5Mb of disk, and preferably 10 to 20Mb for a working installation. Since virtual memory isn't currently supported, the more RAM you can squeeze in the better. The test system was an A2000HD with 3Mb RAM and a 40Mb hard disk (A2091A controller), 7.5Mb of which was dedicated to MINIX.

JARGON BUSTING

GNU – Gnu's Not Unix – a project coordinated by the Free Software Foundation to provide freely distributable software.

Virtual Terminal – Although Amiga Minix doesn't support a windowing system, it is possible to have up to four sessions logged in from the system keyboard. Each session is treated as a distinct terminal and the keyboard is only connected to a session when its screen is displayed on the monitor.

Virtual Memory – Although multi-processing systems appear to have huge amounts of memory connected, only a small fraction of this may be real memory. The remainder is made up of swap files on disk. As processes are switched, their memory may be saved to disk to free real memory for the next process.

X-Windows – A windowing comms protocol available on most UNIX machines, but requires custom software to drive the bitmapped displays.

AREXX FOR ALL

Jason Holborn continues his tutorial on ARexx programming. PLUS: the start of a regular look at public domain ARexx add-ons

Welcome back to ARexx for All, the column dedicated to bringing the art of ARexx programming to the masses. Last month we took our first tentative steps towards mastering ARexx. The commands and functions that we covered were still pretty basic, but if you've grasped all the concepts that we discussed, then you're already well on your way to becoming an ARexx hack. This month we continue the theme with a look at two more control structures. Plus we'll be digging deep into the PD libraries to see what's on offer for the ARexx programmer. So boot up your Amiga, install ARexx and get those typing fingers ready...

DECISIONS TIME

In last month's installment, we took a brief look at ARexx's IF...THEN structure, a very handy command that you'll find in just about every programming language under the sun. Decision making is very important within any programming project, regardless of whether you're writing a control script for an image processing program or a complete ARexx application. ARexx's IF...THEN structure is probably one of the most powerful implementations you're likely to find because it allows you to build up what are known as 'nested' control structures. These are a form of decision-making structure that can perform a particular task based around more than one decision performed by the structure.

A nested decision-making structure can be very handy when you want to make further decisions based around the decisions made by an earlier IF...THEN structure. Say, for example, you wanted to write a script that advised the user which Amiga to buy based around their budget. In plain English terms, the decisions that the script would have to make would look a bit like this:

If your budget is less than £300 then keep saving those pennies
If your budget is not greater than £300 then buy an A600
If your budget is not greater than £400 then buy an A1200
If your budget is not greater than £1200 then buy an A3000
If your budget is not less than £2500 then buy an A4000

Obviously you should never base your buying decisions around such a simple algorithm, but as an example of a nested decision-making structure, it serves its purpose well. In ARexx code, we could write this set of decisions as four separate IF...THEN structures, but it would be much neater (and faster in operation) if it were coded as in Listing 1.

LISTING 1

```
/* Nested IF..THEN demo */

say "Please enter budget"
pull budget

if budget < 300 then
    say "Keep saving pennies!"
else
    if budget ~> 300 then
        say "Buy yourself an A600"
    else
        if budget ~> 400 then
            say "Buy yourself an A1200"
        else
            if budget ~> 2500 then do
                say "Buy yourself an A4000"
end
```

GOING WITH THE FLOW

The logical flow of the nested condition structure is pretty simple to follow. As you can see, the code starts by asking the user how much money they have to spend. This is then stored in a variable called 'budget'. Once ARexx knows how much you have to spend, the decision making starts. First off, ARexx checks whether you've got at least £300 to spend. If not, the message 'Keep saving those pennies' is displayed and ARexx jumps out of the IF...THEN structure.

ADDING FUNCTION LIBRARIES

I hadn't intended covering the task of adding function libraries to ARexx for at least a couple of months, but I've recently noticed within the *Answers* section that many of you have had problems with this relatively simple task.

External function libraries (such as the RexxIntuition library) can be added to the ARexx system in two ways – using the ARexx function ADDLIB() or from the Shell using the ARexx command RXLIB. Both of these methods require you to pass exactly the same parameters, so I'll restrict most of this explanation to the RXLIB command. RXLIB is an external program that can be found in the Rexxc directory of your Workbench 2.0 disk or hard disk boot partition. Its sole role in life is to add the name of an ARexx function library held in the LIBS: directory to ARexx's library list. Once added, ARexx scripts can access the functions in that library as if they were built into the ARexx core.

RXLIB expects to be passed four parameters – the name of the library, the library's priority, its offset value and a version number. The name of the library is pretty obvious because it's simply the filename of the function library as it appears in your LIBS: directory (don't forget that all library files – including ARexx libraries – must be held in the LIBS: directory). The precise format of the RXLIB command is as follows:

```
RXLIB <Library Name>
<Priority> <Offset>
<Version>
```

The priority parameter is simply a value between 100 and –100. In most cases though, go for a priority value of 0.

Next up we have the offset value which is slightly more complex. There's no general rule for obtaining this value – all you can do is to check the documentation which comes with the function library that you're trying to install (this offset value is always stated with the documentation of a function library – if it isn't, then the library is useless). Don't try putting any old value here. If you do, the Amiga is more than likely to complain bitterly and a less-than-amusing 'Software Failure' requester will be displayed.

Finally we have the version number. The version number isn't really that important unless you're writing a script that will only work with an updated release of a particular library. Under normal circumstances though, just state a value of 0.

If you wish to automate this process, you can use the ADDLIB() function from within your scripts. This will allow your ARexx scripts to access the functions within a function library without you having to add the library to the library list first. The format of the function is very similar to that of the RXLIB command which we saw previously, and is as follows:

```
addlib("libraryname.library"
, Priority, Offset, Version)
```

LISTING 2

```
/* Select...When Demo */

say "Please enter budget"
pull budget

select
        when budget < 300 then
                say "Keep saving those pennies!"
        when budget ~> 300 then
                say "Buy yourself an A600"
        when budget ~> 400 then
                say "Buy yourself an A1200"
        when budget ~> 1200 then
                say "Buy yourself an A3000"
        when budget ~< 2500 then
                say "Buy yourself an A4000"
        otherwise
        end
```

If you've got at least £300 to spend, the IF...THEN structure then checks your budget to see which type of Amiga you can afford.

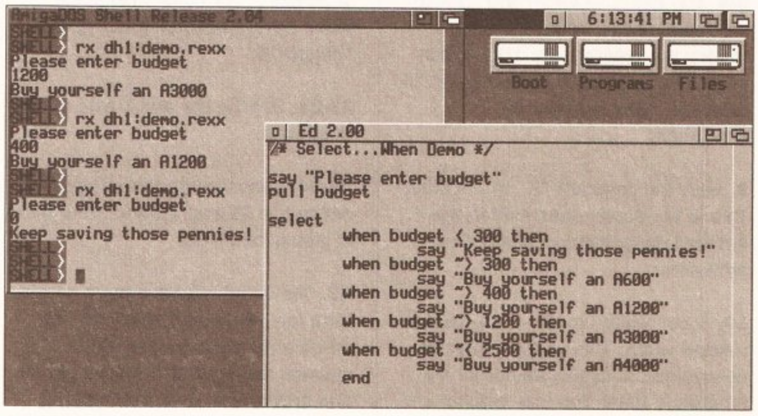
One significant thing to note here is the use of the 'do' instruction on the end of the last IF statement. The do instruction is very important indeed because it tells ARexx that the line where it appears is the last part of the nested structure. It doesn't actually mark the end of the structure though, so you should also use the 'end' instruction to terminate the structure. 'Do' should therefore be appended onto the end of the last IF or ELSE instruction (whichever comes last). I guess I should have told you this last month, but better late than never.

HEAD CASE

However, it has to be said that nested IF...THEN statements are a little untidy and perhaps a little hard to understand. A neater and easier method of grouping decisions is the SELECT...WHEN structure, the ARexx equivalent of BASIC's CASE.

The SELECT...CASE structure is used for much the same decision-making operations as a nested IF...THEN structure, but it has the big advantage of being far more readable. You should therefore use the SELECT...WHEN structure in preference to a nested IF...THEN structure whenever possible. Listing 2 is the same program that we coded before, using the SELECT...WHEN structure instead.

Sure, it's not very exciting, but at least it's more readable than the nested version we covered earlier. In fact, it's very close to English. However, one thing worth noting is the 'otherwise' clause at the end of the structure. The 'otherwise' clause is really there as a sort of safety net that comes into play if all the 'when' tests prove false. Think of it as a sort of 'if all else fails, then do this' option. Although it's technically optional, it's always worth putting it in just in case. If this happens and no 'otherwise' clause is found, ARexx will chuck up an error message informing you that the 'otherwise' clause is missing. But if one or more of the 'when' tests does prove to be true, ARexx doesn't complain about the absence of an 'otherwise' clause. Hmm, I have to admit that this is one peculiarity of ARexx that I'm not overly keen on. Oh well, see you next month!



Whenever possible, try to use the SELECT...WHEN structure in preference to a nested IF...THEN structure. The main reason for this advice is that a SELECT...WHEN structure is simply easier to understand!

EXTENDING AREXX FOR FREE

As we discussed in the first installment of the ARexx column, the core of ARexx actually contains very few commands. But, thanks to ARexx's modular approach, it's possible to extend the language almost infinitely by calling external libraries containing ARexx functions. Sourcing these libraries is actually much simpler (and cheaper) than you may think. How much for all this added power? £100? Nope. £50? Nope. £10? Nope. How does 'free of charge' grab you? Believe it or not, but the PD libraries contain an enormous selection of ARexx libraries and utilities.

As a bit of a sideline to this column's ARexx tutorials, we'll be taking a look at what the PD libraries have to offer the ARexx programmer. Thanks to the wonders of CD-ROM technology (isn't the A570 wonderful!), I was able to scour the Fred Fish library in search of ARexx utilities. I wasn't expecting to find anything particularly impressive, but how wrong I was. The PD libraries have proved themselves to be a wonderful source of ARexx utilities and tools – I even managed to find an ARexx compiler! Without further preamble, let's get stuck in to all that tasty ARexx PD...

REXXINTUITION

Fred Fish #463

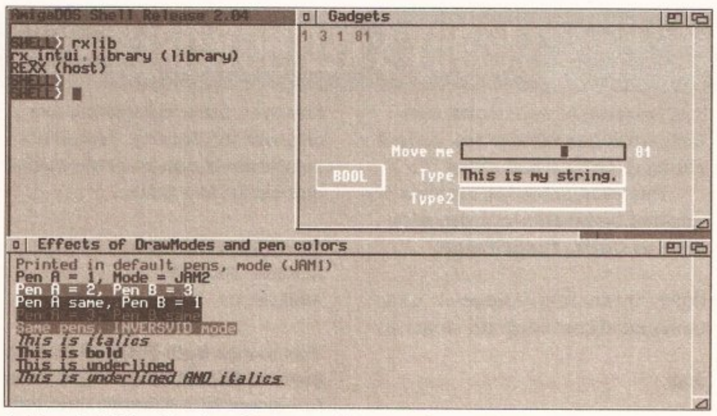
Jeff Glatt of Dissidents Software has done Amiga ARexx programmers proud with RexxIntuition. This function library that allows ARexx programmers to write scripts that can take full advantage of Intuition, the Amiga's powerful windowing interface. By simply adding the library to the ARexx library list using the AddLib() function or the DOS command RXLIB, your ARexx scripts can open screens and windows, manage menus and communicate with Intuition through the IDCMP (Intuition Direct Communications Message Port) without messing around with complex library offsets.

Considering the complexities of programming Intuition using conventional languages (have you ever tried to program Intuition through C?), Jeff Glatt has done a fine job of simplifying the process without removing the power of Intuition. A wide selection of demo scripts are included to show you practical uses of the library and all the function calls are documented in the sort of lucid English that such a complex subject requires. Although beginners may still find the library somewhat difficult to master, experienced ARexx programmers wishing to add Intuition front ends to their scripts should check it out. In all, RexxIntuition is one extension that should not be missed.

REXXHOSTLIB

Fred Fish #682

If you're an applications programmer, then RexxHostLib is for you. It's a totally re-entrant library that will allow you to add an ARexx port to your own programs, regardless of whether they're written in C, assembler, Pascal or even AmigaBASIC. Adding ARexx support to programs is usually quite a complex task (especially if you're not programming in C, ARexx's native language), so the library could prove to be a real boon for both amateur and professional software developers alike. The library comes with all the (header, linker and FD1) files that you'll need to access it from a variety of different languages including C, assembler and Basic. Highly recommended.



Add an Intuition front end to your ARexx scripts and macros with Jeff Glatt's excellent RexxIntuition function library

CRACKING the shell

Graphic displays in AmigaDOS 2? Mark Smiddy demonstrates how your scripts can produce bar charts and calculate fractions

Why would anyone in their right mind want to use a DOS command language to produce graphics? Back in the days when computers didn't have proper graphics, everything was done with fixed width characters. As a respectful salute to those pioneering machines I now present an AmigaDOS screen-based charting program. The example given here produces horizontally-aligned bar charts for integer data values between -10000 and +10000, which can be automatically or manually scaled.

This might appear something of an esoteric problem, but the solution addresses some interesting areas, not least how to handle fixed point arithmetic. FORTH programmers have being doing such things for years, but most of us take floating point for granted in other high-level languages such as BASIC. The theory behind fixed point arithmetic is quite involved so the discussion is featured in its own box on page 94. The program requires AmigaDOS 2 (sorry about that) since it makes extensive use of the new environment handler.

The BarGraph script (given in full on page 91) reads data and labels from a text file. Typically a data file will look like this:

```
D1  200
L1  Jan
D2  325
L2  Feb
```

and so on. Data Values are prefixed by Dn and labels by Ln where "n" is the number of the data item or label (1-11 characters) attached to it.

> "...I now present an AmigaDOS screen-based charting program"

Every data item must have a label and all the items must be separated by two spaces. This is slightly more complex than spreadsheet-based graphics, but is necessary for speed; and AmigaDOS isn't exactly fast at the best of times. Once the data file has been created and saved with the name 'Data' ion the T: directory, the script is called like this:

```
1>Bargraph T:Data
```

Using the default settings like this, the script determines the maximum and minimum values for the X axis by taking the highest and lowest values from the data set. This may produce unwanted results, so either or both of these can be set at run-time. For example:

```
1>Bargraph T:Data Min=50
1>Bargraph T:Data Max=3000
1>Bargraph T:Data Min=-200 ↵
Max=200
```

The number of data items that can be plotted depends on the height of the current CLI window — although the width of the plot assumes a full-width, hi-res screen. Using an interlaced screen with a larger window will afford better results.

Finally, a simple X axis label, header and sub-header can be defined like this:

```
1>Bargraph T:Data Min=0 ↵
Max=5000 Header="Accounts" ↵
sub="3/1/93"  XAxis="Pounds"
```

HOW IT WORKS

(Remember – don't type in the line numbers; they are just there for reference purposes.)

1. Defines the key as described above. Note the data file name is a required argument, all other parameters are keywords and must be supplied with the data.

2-4. Re-define the "bra", "ket" and "dollar" characters.

5. Copies the data file to the T: assignment (in RAM) with the filename "DATA".

6-8. Add EVAL, SEARCH and JOIN to the resident list. While you are testing the program the ADD switch should be omitted to save memory in case the script terminates abnormally.

9. Sets the constant "K" to 100000. This is the scaler described in the detailed description of fixed point arithmetic.

10. Sets "width" to 56 — the usable window width. This value is used to determine the scaling factor for the program's data. You may experiment with this value, but it must always be an even number for *BarGraph* to work correctly.

> "...an esoteric problem, but the solution addresses some interesting areas"

11. Sets scan ON. The chart is plotted in two phases, the first phase scans the data for the upper and lower boundaries — the second plots the chart.

12-14. These three local variables are set to the contents of the axis labels. If any are missing, a single space is set instead.

15-17. These set the default scan values for the lowest, middle and maximum points on the chart. Global variables are used because they can be written to directly by AmigaDOS commands.

18. Directly writes the global variable "Middle" to half the value of Width.

19. Stores an adjusted value to centre the X axis – held in "MidPoint".

20. This line is not usually used, but is provided here as an alternative graph style. Using the listing as shown, the bars will be black. By replacing line 21 with this one, the bars appear with a hatched pattern. You can use either of these or design your own — but do not use asterisks (*) or dollars ($) since these have a special meaning to AmigaDOS.

21-22. Set the bar and X axis styles to spaces.

23-24. Concatenate the strings defined at 21 and 22 and store them in global variables.

25. The script will have been running for a few seconds by now, so this prints a progress message to indicate the start of the scan phase and prevent the user from getting worried. During this time the script is looking for values outside those determined by Max and Min.

SMIDDY'S RED HOT TIP

It is reasonably well known that AmigaDOS can refer to the current directory using a null string "".

This overcomes the problem of required arguments in commands such as COPY. For instance:

```
COPY "" to DF0:FooBar ; use↵
current directory as source.
```

and

```
COPY DF0:Fred to "" ; use↵
current dir as destination.
```

However, other commands can also use this facility. Temporary assignments can be made quickly and easily, like this:

```
CD SYS:Utilities
ASSIGN FOOBAR: ""
ASSIGN U: ""
```

This makes both FOOBAR: and U: point to SYS:Utilities. If you were to change to a different directory and do the assigns, they would point to that directory instead.

LISTINGS • LISTINGS • LISTINGS • LISTINGS • LISTINGS • LISTINGS • LISTINGS • LISTINGS

Listing 1: BARGRAPH

```
1.	.key data/a,min/k,max/k,xaxis/k,header/k,sub/k
2.	.bra {
3.	.ket }
4.	.dollar |
5.	copy {data} T:data
6.	resident c:eval add
7.	resident c:search add
8.	resident c:join add
9.	set K 100000
10.	set Width 56
11.	set scan ON
12.	set Header {header|" "}
13.	set Subhead {sub|" "}
14.	set Axis {Xaxis|" "}
15.	setenv max {max|1}
16.	setenv min {min|0}
17.	setenv mid 1
18.	eval $Width/2 to env:Middle
19.	eval $Middle -2 to env:MidPoint
20.	;echo >T:G "/\/\/\/\/\/\" noline
21.	echo >T:G "                    " noline
22.	echo >T:H "            " noline
23.	join T:G T:G T:G T:G T:G T:G T:G T:G T:G as ENV:Bar
24.	join T:H T:H T:H T:H T:H T:H T:H T:H T:H as ENV:XAxis
25.	echo "Scanning..."
26.	lab again
27.	setenv loop 0
28.	lab Read_loop
29.	eval $loop + 1 to env:loop
30.	eval $loop to env:number lformat "D%n "
31.	eval $loop to env:labels lformat "L%n "
32.	search >env:data T:data $number nonum
33.	if warn
34.	 skip done
35.	endif
36.	echo "$data" first=4 to env:ndata
37.	if val $ndata GT $Max
38.	 setenv Max $ndata
39.	endif
40.	if val $ndata NOT GE $Min
41.	 setenv Min $ndata
42.	endif
43.	if $scan EQ OFF
44.	 echo "$XAxis $XAxis $Axis" len=$Middle
45.	 eval (($Max-$Min) * $K)/$Width to env:Scale
46.	 eval (($Max-$Min)/2)+$Min to env:Mid
47.	 echo "               " noline
48.	 echo "$Min$XAxis" first=1 len=$MidPoint noline
49.	 echo "$Mid$XAxis" first=1 len=$MidPoint noline
50.	 echo "$max"
51.	 echo "..........!" noline
52.	 echo "........................!" noline
53.	 echo "..........................!"
54.	 set scan SHOW
55.	 echo "*e[41m*e[32m" noline
56.	endif
57.	if $scan EQ SHOW
58.	 search >env:lab T:data "$labels" nonum
59.	 echo >env:labels "$lab$XAxis" first=4 len=10 noline
60.	 eval ( ($ndata - $min) * $K ) /$Scale to env:dlen
61.	 echo "*e[44m" noline
62.	 echo "$labels " len=10 noline
63.	 echo "*e[41m" noline
64.	 echo "$Bar" first=1 len=$dlen noline
65.	 echo "*e[44m" noline
66.	 echo "$ndata" len=12
67.	endif
68.	skip Read_loop back
69.	lab done
70.	if $scan EQ ON
71.	 set scan OFF
72.	 skip again back
73.	endif
74.	echo "*e[44m*e[31m"
75.	echo "*e[I$Header"
76.	echo "*e[I$Subhead"
77.	resident c:eval add
78.	resident c:search add
79.	resident c:join add
```

26. Marks the start of the main loop.

27. Sets the global variable "Loop" to 0. This value is used as a data index, as you will see later.

28. Marks the start of the scanning loop.

29. Increments "Loop" by 1.

30. Writes the global variable "Number", prefixing the value with "D" and suffixing it with a space. On the first loop, therefore, Loop=D1.

31. As 30 but storing Ln in "Labels".

32. Searches the data file for the current data item (for the contents of "Number") and stores it in the global "data". The "nonum" switch suppresses SEARCH's unwanted line numbering facility. Using the example data file supplied here, if "Number=D1" then "Data" receives:

```
D1  2200
```

Note the entire line is read from the data file – this is corrected later on.

33-35. If the numbered data item could not be found this test forces the script to exit either the scan or display phases. Under normal circumstances this will only happen when all the data has been read and displayed.

36. String slices the numeric data from the string generated at Step 32 and stores the result in the global "NData". Using the FIRST keyword on its own forces ECHO to retrieve the whole string starting from position four and moving right. Using the current example:

```
D1  2200
```

translates to

```
2200
```

37-39. Tests if the current data value is greater than the current maximum chart value, and resets maximum to the data value if it is. Since this test is in a loop, all data points are tested (the scan phase) so the highest point on the X axis is always at least equal to the highest value in the data.

40-42. As above, but sets the lowest data point. The function "NOT GE" is the AmigaDOS IF version of "less than" (written as "<" in some languages).

43. If "Scan" is ON (the scan phase) control skips to Step 56 otherwise it continues at Step 44.

44. Prints the right side of the string made up from a lot of space ($XAxis) plus the X axis ($Axis) label. This centres it roughly over the X axis.

45. Calculates the scaling value described in the detailed description of fixed point. Assuming Max is 500 and Min is -500, the calculation works like this:

$$Scale=\frac{(Max-Min)*K}{Width}$$

$$Scale=\frac{(500–500)*100000}{56}$$

Scale=1785714

46. Calculates the value of the midpoint and it stores in the global "Mid".

47-50. Print the X axis labels. This is completed in several stages.

47. Prints some blank space characters above where the labels will appear.

48. Prints the Minimum scale value followed by some padding space – the amount of which is determined by the value of Midpoint. This is crude, but it works.

49. Does the same as above with the Middle scale value...

50. ...and this displays the highest scale value, "Max".

51-53. Display the X axis graticule. Not posh, but functional.

54. Changes the "scan" variable to "SHOW" so the program will enter the display phase (at Step 57).

55. Alters the display colours to white text on a black background. The text foreground colour is changed primarily to show hatched bars (an option described above) but it also makes the labels and other markings stand out.

56. Closes the IF...ENDIF construct opened at Step 43.

57. Tests if the "scan" variable has been set to "SHOW" (the display phase).

It is important to note that since this is an iterative script, this variable is not changed until the scanning phase is completed.

LISTING 2

Sample data file (only five items shown)

```
D1  2200
D2  2300
D3  2400
D4  2100
D5  2700
L1  January
L2  February
L3  March
L4  April
L5  May
```

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THE FIXED POINT THEORY – DECIMAL FRACTIONS IN AMIGADOS

AmigaDOS does not handle numeric data particularly well. Even the simplest calculation must be carried out by a special command: EVAL. But EVAL is only capable of very simple arithmetic and does not handle decimal fractions at all. For instance: 7/2 gives 3 remainder 1 and even this must be performed in two distinct steps.

(The details following apply to any language – not just AmigaDOS – and can get machine code programmers out of some tricky situations. Unless shown most of the results are truncated integers as would be returned by EVAL. This should be considered when checking the arithmetic with a calculator.)

Consider the sum "7/2". Using traditional methods: two goes into seven three times, with one left over (the remainder). Pop the remainder (1) over the divisor (3) and you are left with the vulgar fraction 1/2. This is fine for dividing up a cake, but not much use in computer maths. The decimal fraction version of this is:

$$\frac{Dividend}{Divisor}=\frac{7}{2}=3.50$$

Of course, most of us can do that in our heads, but AmigaDOS cannot. Now suppose we change the scale of the figures somewhat by multiplying just the dividend by 10.

$$\frac{Dividend*Scale}{Divisor}=\frac{(7*10)}{2}=\frac{70}{2}=.350$$

The result is to move the (purely imaginary) decimal point one place to the right. However we have also retained the fractional part – this is the essence of fixed point arithmetic. To show this in more detail let's take a slightly more complex problem: 2/5 for instance. Using our integer AmigaDOS calculation, we get:

$$\frac{2}{5}=0$$

Even though the real answer is 0.4. Now we'll use a constant (K) of 1000 to get something more realistic:

$$\frac{(Dividend*K)}{Divisor}=\frac{(2*1000)}{5}=\frac{2000}{5}=400$$

Result=400=0.4
K 1000

So far so good— but what is the point to all of this? Consider a set of values between 0 and 1000 which must be scaled down to fit on an axis with 70 plottable points. The scaling factor can be calculated thus:

$$Factor=\frac{70}{1000}=0.07$$

And any value can be plotted by multiplying it by the scaling factor 0.07. Take a value of 500 which is half-way up the scale:

Data*Factor
=500*0.07
=35 points

Since AmigaDOS would lose the fractional part in the original calculation – 0.07 becomes 0 – the scaled value would be useless. By using a constant of 5000, we can calculate the scaling factor thus:

$$Factor=\frac{Max\ Data * K}{Plot\ Width}=\frac{1000*5000}{70}=71428$$

To arrive at a final result we must now divide the data by the scale factor and multiply the result by the constant:

$$Points=\frac{Data * K}{Factor}=\frac{500*5000}{71428}=35$$

Since no fractions are involved in this calculation, AmigaDOS can manage. Provided the scaler is large enough, some fairly complex arithmetic can be performed. In some cases, part of what would have been the decimal fraction is discarded, but this is common in all maths and so is nothing to worry about. You can see this in action by dividing 7 by 6 – a calculation which always results in a recurring fraction: 1.16666666 (or rounded up: 1.167):

$$\frac{(7*10000)}{6}=\frac{(70000)}{6}=11666$$

As a guideline, the size of the scaler determines the accuracy of the calculations. A scaler of magnitude 10000 sets an internal accuracy of one ten thousandth (the last digit is dropped due to rounding errors)

Unfortunately, the size of the scaler is finite: an error will occur if, in any calculation, the scaler multiplied by the scaled data exceeds the operational limit of EVAL.

58. Extracts the current label (Ln) from the data file and stores it in the global "Lab".

59. Prints the current label with the correct amount of padding spaces to position the cursor ready to print the bar. The length of the string printed is always 10 characters regardless of the length of any particular label – longer ones are truncated.

60. Calculates the number of characters required to print the bar. If we assume that "Ndata" is 350 and "Min" is -500, the calculation works like this:

$$Dlen=\frac{(ndata-min)*K}{Scale}$$

$$Dlen=\frac{(350-500)*100000}{1785714}$$

Dlen=47

So the length of the bar representing 350 on a scale of 500 to -500 is 47 characters of 56 possible (as defined in "Width" – see above). Work that out on a calculator and you will find the result is out by a fraction, but such things are outside the limits of the display. Using a proportional font (such as Times) could improve the resolution ten-fold, but the console device cannot cope in release 2.

"...the size of the scaler is finite: an error will occur if... the scaler multiplied by the scaled data exceeds the operational limit of EVAL"

61. Changes the background colour to default (slate-grey). This, like many of the other colour changes *must* be done separately otherwise the string slicing will get in the way with unpredictable consequences.

62. Prints the current label with one extra padding space.

63. Changes the background colour to black.

64. Prints a bar according to the magnitude of the current data. See Step 60 for details of how the variable "Dlen" is calculated.

65. Changes the background to slate-grey...

66. ...and prints the actual value of the data displayed. This is an optional feature but has been included here to help overcome the deficiencies with the display resolution.

67. Terminates the IF...ENDIF construct opened at Step 57.

68. Jumps back to Step 28 and does it all again for the next data point!

69. Marks the escape point.

Control jumps here from the line at Step 34 when the last data point has been read or charted and the data table has finally been exhausted.

70. Checks if the scan phase is still active. If the scan has been completed control jumps to Step 74 and exits, otherwise...

71. ..."scan" is set to OFF to mark the end of the scan phase and the start of the charting phase and...

72. Control jumps right back to the start and does the whole lot again, though this time it's for real.

73. Terminates the IF...ENDIF block opened at Step 71.

74-76. Put everything back to normal, print the header and sub-headers...

77-80. ...and finally remove SEARCH, JOIN and EVAL from the resident list.

Next month I'll be including a resistor calculator which uses some unique and unusual features found in AmigaDOS Release 2.

I'll also be showing you even more wild and wonderful things that you can do with the wonderfully powerful AmigaDOS. AS

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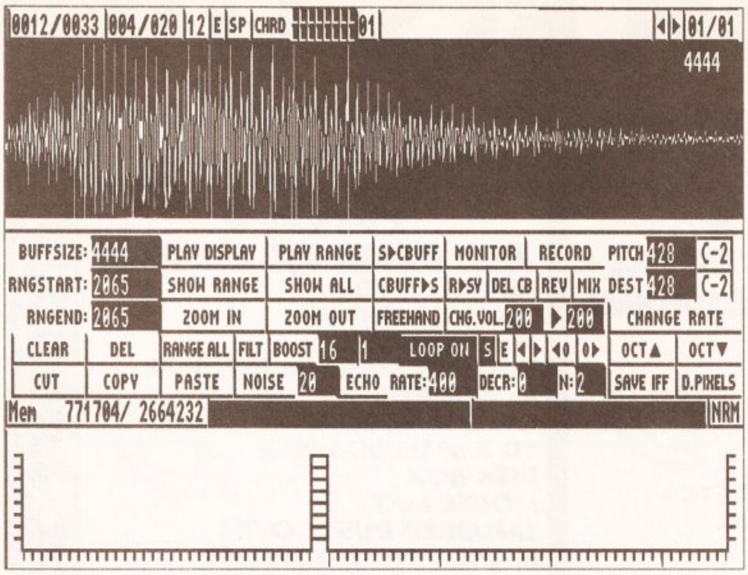
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Keep this

Choosing the correct sampling rate is vital to the quality of your sounds. Paul Overaa clears up some common misconceptions



Any sampling program worth using will allow you to adjust the frequency at which your sounds are digitised. But finding the correct rate for any particular sound is a different matter altogether!

Just the other day, somebody asked me why his samples never sounded as good as those from commercial and PD sources – even though he was sampling all his sounds at "the ideal rate". After a bit of additional questioning it turned out that the chap in question was a computer buff, not a musician, and the 'ideal sample rate', twice the frequency of the note being sampled, had been obtained from the manual of his Amiga sampler.

As is often the case, straightforward questions often have less than straightforward answers and with sampling the final audible result can depend on many factors: in particular, the quality of the original sound, and whether the sample was taken directly (in other words, with the audio source plugged straight into the sampler's input sockets) or whether a microphone was used. In the latter case much depends on the quality of the microphone, and sometimes even its suitability for the sound being sampled. However, given that a decent strength quality input signal is being provided, about the only other thing that can put a 'spanner in the works' is the sampling frequency.

The idea of sampling at a frequency double that of the sound being sampled stems from something known as the 'Nyquist theorem'. Since this is an area where a little knowledge can be a dangerous thing, some background details might be useful. So, this month I'll first explain what the Nyquist relationship is, and then proceed to reveal why you in fact need to take it with a large pinch of salt (or should that be two large pinches?) when deciding the sampling rate to use when sampling most musical sounds.

> *"...with sampling, the final audible result can depend on many factors..."*

TAKING A SAMPLE

To understand sampling more fully, let's go right back to the basics. You all know that a musical note is made up of sound waves that have a certain pitch (frequency) and a certain loudness (amplitude). When you listen to a piece of music, or listen to anything else come to that, what you are hearing is a mass of sound waves which include many different frequencies and amplitudes. The result, in most cases, is a very complex waveform.

If at any point in time you could 'freeze' the sound you were hearing you could measure the amplitude of that part of the sound wave. Using some agreed convention you could then express that amplitude as a number. If you did the same thing over and over again a whole series of numbers could be obtained and, at the end of the day, you would have a list of numbers that corresponded to the numerical equivalent of the original sound.

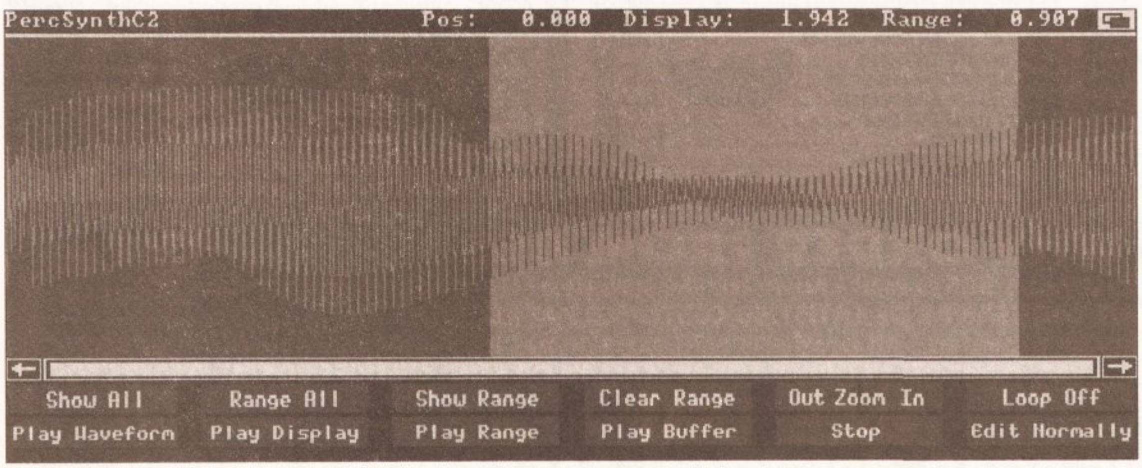
These ideas are of course the basis of 'sound sampling'. By using special hardware which grabs and measures (or in other words, digitises) that amplitude information many thousands of times a second, it is possible to build up a detailed digital copy of the original sound. On the Amiga the hardware which does this usually attaches to the parallel port. Once a sample has been taken, a whole new world opens up because sample editing can then be used to carry out sophisticated transformations. This makes it

> *"Once a sample has been taken, a whole new world opens up..."*

possible to achieve effects which are quite simply not feasible with conventional analogue recording techniques. A user can, for instance, take pieces of one sound and mix them with another, can speed up or slow down the rate at which a sample is played, or even shift the time-position of a sample before adding it back to itself to create some very interesting effects.

Now this all sounds fine – until you try it and realise that sample recording and editing is not always as easy as some would have us believe. There are a number of things which can cause poor quality samples but in the final analysis the upper quality limit stems from the Amiga itself.

As you would expect, the quality of any sample depends on the accuracy of the digitisation process and here there are two variables to consider: sampling rate and the resolution of the numbers used to define the amplitude. Fast sampling rates would intuitively be expected to give better waveform detail but it should also be pretty obvious that quality can also be improved by



A lot of fundamental research has been done on the sampling of continuous waveforms! Even if something sounds simple to the human ear, the chances are that the waveform will have distinctive high frequency components. If your sample does not include these, the sound quality will be degraded when it is played back

frequency clear

increasing the range of numbers used to represent the amplitude measurements.

On the Amiga, amplitude digitisation is performed to an accuracy of 8 bits, so there are 256 possible values. Using the Amiga's internal sound chips this is sufficient for producing some excellent playback sounds. Although it's not as good as CD technology sampling (which uses 16-bit amplitude resolution) it is possible to get surprisingly good results. It is incidentally the amplitude resolution that has limited the interest in Amiga sampling for the more demanding professional applications.

So, in order for a computer to digitally record a sound, the signal has to be sampled at some regular interval. In effect, what the sampling hardware does is take snapshots of a continuously changing signal (the sound you are providing as input to the sound sampler). Because of both computer and hardware limitations these 'samples' are both time quantised and limited to discrete steps in amplitude.

ENTER THE NYQUIST RELATIONSHIP

Mathematicians have a lot to answer for – they produce absolutely rigorous results but constantly fail to tell the rest of us that their 'mathematical models' only *approximate* real-world behaviour. Is from the world of mathematics that this Nyquist theorem comes...

The Nyquist sampling criterion attempts to relate characteristics of the digital sample to those of the original waveform. In fact the general Nyquist criterion is obtained by taking a mathematical description of a sample's frequency spectrum and applying some rather complicated Fourier transform mathematics.

The result is a relationship which can be stated in many ways, but essentially says this: a continuous time waveform, when sampled at a frequency greater than twice the maximum frequency component in its spectrum, can be reconstructed completely from the sampled waveform. Samples can suffer from a waveform distortion known as 'aliasing' when taken at sampling rates of less than this Nyquist-predicted frequency.

What this is often wrongly taken to imply is that if you are sampling a sound with a frequency of 10KHz you will need to collect data at a frequency of at least twice this (20KHz, in other words) to get a decent sample. With 'pure' tones this would be true but in real life things go sadly amiss...

THE BIG SNAG

Supposing you wanted to take a sample of the open sixth string of a guitar.With a normally-tuned guitar this string has a frequency of about 82.4Hz. So, according to the Nyquist relationship you'd expect that a sampling rate of 165 samples per second would be fine (or as near to that figure as your sampler can get). In practice these predicted sampling rates lead to samples that, sound-wise, are a complete and utter dead loss! Why? It is because when you hit something like a guitar string you don't just get the fundamental note frequency – you also produce a whole range of other frequencies, called harmonic overtones. These overtones or 'harmonics' can include frequencies which are a factor of ten or more higher than the main note.

Harmonics affect the 'timbre' of the note and are what make the perceived sounds of a particular note from, say, a guitar distinctly different from the same note played on a piano, flute or other instrument. This is bad news for anyone thinking that they'll be able to get away with low sampling frequencies just because they are sampling sounds that have a low fundamental tone frequency. What the Nyquist relationship really means is that you must use a sampling frequency at least twice as fast as the frequency of the highest frequency component present in the original waveform. The Nyquist relationship, as a practical tool for estimating sampling frequencies, gets blown out of the water when you realise that you also have to capture the harmonic overtones in order to recreate the sounds of most musical instruments. This is because you will never be quite sure of the frequencies present in the overtones of a particular musical instrument!

The only real solution is to forget any ideas of calculating sample rates and so forth, and do what musicians have always done – listen to the sounds and let your ear tell you whether you have a good sample or not. Musicians definitely have the upper hand here, especially when sampling instruments that they are familiar with, because they can instinctively tell when those harmonic overtones are either missing or poorly recreated.

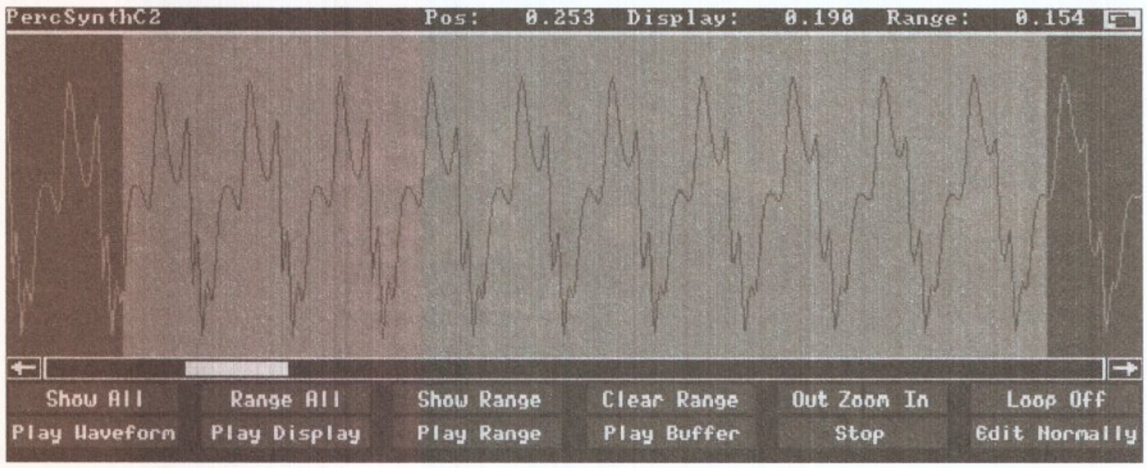
There is always going to be a compromise between getting the best quality and keeping sample sizes to a reasonable level, but there's nothing to stop you starting with a high sampling rate and reducing it until you are sampling at a frequency just above the one where you felt there was an unacceptable quality difference.

> **"The only real solution is to forget any ideas of calculating sample rates and so forth..."**

The Nyquist theorem does tell us something qualitatively useful by suggesting that when things start going astray it is the higher frequency information which is lost first. This in turn suggests that if, for example, we are checking the sampling quality of a particular guitar note we should be listening not to the fundamental note, but for the presence (or indeed the absence) of those all-important harmonics that give the note its distinctive sparkle.

Incidentally, there is another source of distortion-based quality loss that is worth mentioning. Some software allows the IFF 8SVX sample data to be 'compressed' to save space. Fibonacci-delta compression, the technique that is always used, is not really suitable for compressing musical instrument samples – it can, and usually will, introduce distortion that is especially noticeable on samples recorded at low sample rates. Sometimes you can get away with it but, as before, the only safe solution is to experiment and let your ear be the judge!

Just in case you are wondering why so much effort has been put into the mathematics of sound sampling, let me hasten to add that it wasn't the advent of sound sampling in the musical sense that provided the impetus for this massive amount of research. Physicists, instrumental chemists, and many other scientists have been interested in the sampling and analysis of continuous waveforms for ages. All that has happened as the low-cost sound sampling era took off is that the results of this research has been re-applied to this new area.



Here our sampler has drawn a graph of a relatively pure tone, which consists of several sine waves superimposed on each other. Pure tones tend to be rather dull to listen to – you can bet that most of the real-world sounds that you're interested in will have high frequency components, which means high sample rates, and big samples!

Sonic Boom

Boom Box, the newest product from Dr T, is aimed directly at the less serious musician. Paul Overaa finds out how easy it is to make an instant hit

Products which 'get music into the hands of the masses' seem to be the 'in thing' at the moment: packages like Blue Ribbon Soundwork's *SuperJAM* have certainly shown that the mass-market philosophy can pay off handsomely. However, even programs like *SuperJAM* need some guidance. If you are not particularly interested in learning about things like chord progressions, using MIDI or the ins and outs of style creation, then the chances are that even these types of programs will still leave you musically 'out in the cold'.

Suppose you don't want to be bothered with any of the serious music issues at all – but you do like the idea of 'tinkering around' with a system that makes light work of creating funk, rap, and pop-type music and allows you to add sample effects and simple melodies to backing created by the program. If this sounds like your bag then your wait is over and you'll find Dr T's new *Boom Box* package an ideal partner. *Boom Box* is a program which allows you to use the mouse or keyboard to play drums, bass and synthesiser patterns and to trigger various solo sounds. It's designed for the 'less musical' masses, comes with a manual that takes only ten minutes to read from cover to cover, and makes no pretence of being anything other than a 'fun to use' music program that, at the end of the day, produces something reasonable to listen to.

> *"a system that makes light work of creating funk, rap and pop-type music"*

Boom Box is available for both the Amiga and the PC and the manual deals with both program environments at once by providing 'box outs' which deal with various machine-specific issues. Within this format the manual divides into two parts. There is a 'front panel' section which deals with the main *Boom Box* controls, and a back-panel reference section which provides an easy guide to the menus and other features.

Boom Box will run on any 1.3 or WorkBench 2 machine with 1Mb or more of memory. When the program starts the *Boom Box* screen (Figure 1) appears and (surprise, surprise) it looks very much like a 'Boom box'-style portable tape-deck. Pressing on the Amiga top row number keys lets you play a selection of samples. If you then press 'Play' you'll hear some backing that you can play along with. Press 'Record' and do the same thing and your efforts will be recorded until you hit the 'Stop' button. At this point, the 'mix' (which includes the backing) automatically rewinds and *Boom Box* enters playback mode, ready for you to listen to what you've created.

> *"5-8 year-olds especially are going to love it"*

Control-wise the main *Boom Box* screen couldn't be simpler: There's a set of tape-transport controls (Play, Stop, Record, Fast forward and Rewind), and four drag sliders so that the relative volumes of drums, bass, synth and solo instruments can be adjusted and viewed via a set of four on-screen VU meters. There's also animated tape cassette rolling and speaker movement thrown in for effect but basically that is about all there is – we are talking about seriously easy-to-use software here.

A SOUND INVESTMENT?

The Remix screen works a bit like the main screen only it lets you do rather more. It's possible to change tempo, add effects using the special FX fader controls, re-trigger samples and so on. The third screen, called the Jam screen, looks like the remix screen but it allows you to switch patterns – at the bottom of the Remix and Jam screens there is a set of controls which allow you to select one of four drum patterns, one of three bass patterns and one of four synth patterns using the function keys (Figure 2). A couple of other gadgets control the loop mode and sample re-triggering facilities. Also included with the Remix and Jam screens are six solo pads which can be tied to particular 8SVX sounds you care to load. These can then be played using either the pads or the number keys.

There are some nice touches, including the recording of fader changes in a way which allows you to see the fader movement during playback. Plus, hitting the Help gadget, and then hitting any other object on a particular screen, will bring up some information on the selected object.

Boom Box is a 'fun music' program strictly for non-serious users. It's also going to be great for kids: 5-8 year-olds especially are going to love it because it'll turn them into budding pop/funk/rap stars overnight!

I will admit that, from time to time, I enjoy playing about with *Boom Box* for a couple of hours – but I wouldn't go out and buy it. Having said that – I know a man who would!



Figure 1: If you can work a tape-deck there's a good chance you'll be able to work *Boom Box*

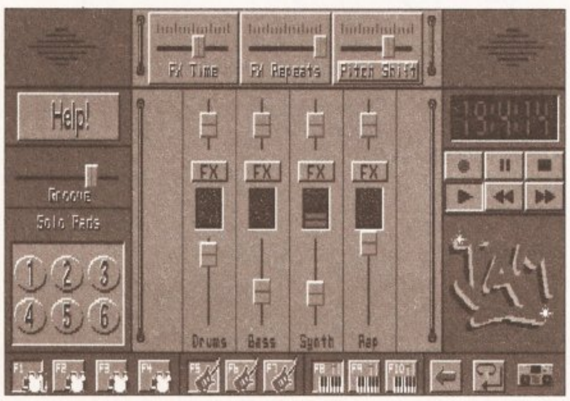


Figure 2: Mixing and effects the easy way with the buttons and sliders on *Boom Box's* Jam screen

SHOPPING LIST

Dr T's Boom Box costs £45 (including VAT)
The package contains the program itself, an additional samples disk, and a manual.

Distributed in the UK by:
Zone Distribution
☎ 071 738 5444

CHECKOUT Boom Box

Ease of Use ●●●●○
Learning how to use *Boom Box* is definitely not going to cause you brain damage. If you are 5 years old or over, and still alive, then you'll handle it!

Features ●●○○○
No MIDI and no clever stuff so there's not that much in the way of additional goodies for most of us to get excited about.

Documentation ●●●○○
Adequate because *Boom Box* has been made deliberately easy to use!

Price Value ●●●○○
A dodgy area this – considering what *Boom Box* is, what it does, and the current state of the market my opinion is that the package is slightly overpriced!

Overall rating ●●●○○

With *Boom Box*, it's a case of 'you pay your money and you take your choice'.

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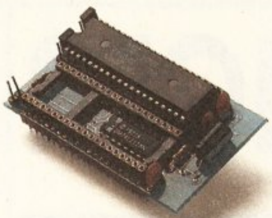
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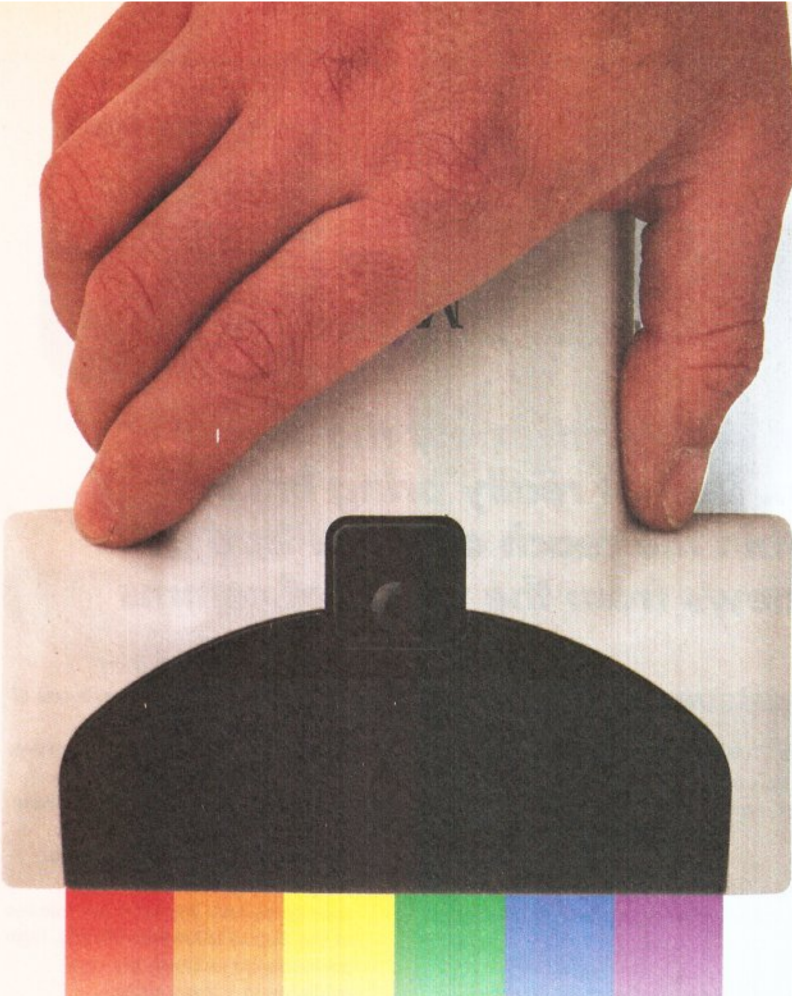
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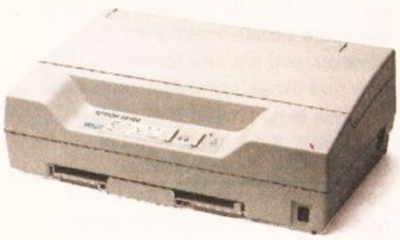
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- Colour

The Amiga interface plugs into an A1500/A2000/A3000/A4000 expansion slot with a separate version which connects to the expansion connector of the A500/A500+. The A500 version has a through-port which is compatible with all Amiga 500 expansion peripherals.

The software supplied with this scanner is the new PowerScan Professional 3, which also supports the greyscale scanner and will be available as an upgrade to existing users of PowerScan for £15.

Colour PowerScan v3.0 features

- Real-time 'True-feel' scan option in colour halftone mode
- Images are stored internally as 12-bit graphics, not HAM. This means that no quality is lost due to the Amiga only being able to display HAM images in 4096 colours
- Images are displayed as HAM pictures
- HAM images may be loaded from disk and edited using PowerScan 3
- Image size that can be handled is limited only by the amount of memory available
- Memory does not have to be chip memory as in many art packages
- Images can be saved in various file formats
- View whole image function
- Scale/rotate/skew image or clipboard by any amount
- Crop image
- Clean up, lighten or darken image
- Variable zoom mode
- Draw freehand, lines, circles, boxes and polygons in various fill patterns, brush sizes, paste modes, or with the clip board image
- Clipboards may be scanned directly, or any shape can be cut from the main image
- The software is compatible with all Amigas
- Supports Workbench 2 and ECS screen modes

Colour PowerScan now available

New v3.0 Scan software

PowerScan Colour v3.0 .... £239
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The Amiga can only display 16 greyscales

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Fast talking

This month, Dave Winder tries out the SupraFaxModem. Does it really bring high performance within the reach of a low budget? PLUS: the latest news from the world of comms

JARGON BUSTING • JARGON BUSTING • JARGON BUSTING

Archiving – In comms terms this means compressing the file you want to transfer, using a special program, so that it is smaller and therefore takes less time to arrive or send.

CIX – Compulink Information Exchange. The biggest conferencing system in the UK and home-from-home for many Amiga developers, journalists, and the like.

ELSPA – European Leisure Software Publishers' Association. Works in conjunction with FAST to achieve the same aims.

FAST – Federation Against Software Theft. An organisation that attempts to stamp out software piracy.

Hayes – An industry standard set of commands for telling your modem what you want it to do. For example, ATDT tells the modem to dial a number using Tone Dialling.

Internet – A network of thousands of online services across the globe.

MNP5 – A protocol which improves the accuracy of the information transferred by using error correction.

V32bis – Another way of saying 14,400bps.

V42bis – Not a rating of speed, but a method of data compression which effectively speeds up throughput.

bps – Bits Per Second. The rate at which information is passed along a data channel.

Choosing a modem is one of the hardest comms decisions you'll ever make. The advice that I have always given is to go for the fastest modem you can afford, the only problem with this being that few people could afford the really speedy models. But with the release of the SupraFaxModem V32bis, high performance modems are now available at a lower price.

The SupraFaxModem itself is surprisingly small, approximately the same size as a video cassette. It is a no-nonsense clean design, sturdy enough to take the inevitable knocks of everyday use. To facilitate the rack storage of the unit, the case has been designed so that the ends can be removed – a nice touch which means it will find a ready market in the corporate sector as well as with hobbyists. The front panel rates as one of the most informative on any modem: instead of the usual run of LEDs there is also an alphanumeric status display, so even the novice can easily understand what is happening during a comms session.

One point to consider is that since the modem is American, it doesn't come with a BT type phone jack. However, the supplier of the modem we tested, First Choice, will provide the necessary phone lead as part of the package.

BREAKFAST TIME

So we have determined this is a well-built, good-looking machine, but what does it do? The answer is just about everything except make the breakfast! First of all it supports the highest of modem speeds, V32bis, which means it can connect at a rate of 14,400 bits per second. However, because it also sports V42bis data compression and MNP5 error correction, the effective transfer rate can increase to an impressive 38,400bps. Of course, to allow compatibility with systems that are using older and slower modems, the SupraFaxModem also supports the lower speeds of 4800, 2400, 1200, and 300 bps.

Secondly, this is also a fax machine as well as a modem. It supports Group 3 fax, and the industry standard Class 1 and 2 fax commands, thus allowing maximum flexibility and compatibility with fax machines and software.

If you are just upgrading from a slower modem you will have no trouble in setting up the SupraFaxModem, as it is fully Hayes compatible. The Hayes command set is the standard used by just about every modem these days, and allows you to set up different modems using the same simple commands. If, however, you are new to comms you may find things somewhat confusing.

This is no fault of Supra – it is just a fact of life in the world of comms. The 'Getting Started' booklet that comes with the unit is rather simplistic, but should prove adequate to get you up and running. Ideally, you should read through the 'Reference Manual' as well – you may find some of the jargon puzzling at first, but you will need to understand a fair proportion of it (especially the Hayes command set) in order to deal with any problems you may come across.

NEWS • NEWS • NEWS • NEWS • NEWS • NEWS • NEWS • NEWS • NEWS • NEWS • NEWS • NEWS • NEWS • NEWS

LICENSED BOARDS?

A rumour reached my ears the other day about the Federation Against Software Theft (FAST) and the European Leisure Software Publishers' Association (ELSPA). The story was that they were planning to lobby Parliament with a view to getting a law passed requiring all UK bulletin boards to be licensed. To get to the truth of the matter, I called the Chief Executive of ELSPA, Roger Bennett.

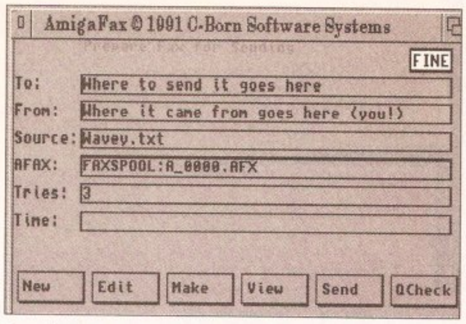
He told me that the rumour is true: licensing BBSs is one of the options that FAST and ELSPA are examining to combat the growing problem of pirated software and hard core pornography being made available via the telephone line. However, Mr Bennett is well aware that the vast majority of systems are operated entirely within the law. ELSPA believe that most legal and genuine bulletin boards will welcome some form of registration in order to maintain their good reputation. "We do not wish to undermine the honest people," Mr Bennett confirmed.

MY CONCERNS

It appears that the scheme is being considered to aid the traceability of pornography and pirate software, and not as a method of raising money to subsidise losses due to piracy. That can only be good news. However, this columnist is concerned that many smaller bulletin boards could be forced to close if they have to pay a substantial amount for a licence to operate. Passing the cost on to the users of the system could also have exactly the same effect.

I understand that a Member of Parliament is involved in the licensing plan, but ELSPA would not confirm the name at the time I spoke to Roger Bennett. I hope that whoever it is has a full understanding of the nature of bulletin boards in this country, and does not force the death of hobbyist comms for the sake of a few people who abuse the system.

If you have strong feelings on this, contact either FAST on 0628 660377, ELSPA on 0386 830642, or write to us at *Amiga Shopper*!



Sending a fax with the SupraModem can be just as easy as printing a document – and uses less paper!

NO MORE MIGRAINE

Once the modem is plugged in and ready to go, the alphanumeric status display comes into its own. I really do like this feature – after many years of watching blinking lights on the front of my modem and giving myself a migraine by trying to recall what the various combinations mean, it is sheer joy to be told what is happening in more or less plain English. For example, if the modem is ready to use, the display says OK. If the display shows DI, the modem is busy dialling. You can tell at a glance if the modem has made a connection to a fax machine or fax modem, what speed you are connected at, and so on.

There have been problems with early versions of the SupraFaxModem, or more precisely with the ROMs used in them. These problems made it very difficult, if not impossible, to make a connection at 14,400bps. As the speed advantage is one of the main selling points of the modem, this was a serious disadvantage. The modem would reduce its speed until it could connect, usually at 12,000bps. This is still quite fast, but not what you had paid for. Supra were obviously aware of this, and have now upgraded the ROMs. The review model I used had these new ROMs fitted and I had no trouble in making 14,400bps connections on all the systems I tried. First Choice inform me that all their current stock have the new ROMs fitted.

WOOOOSH!

A modem of this specification is all about speed. The faster you can transfer files or messages to or from your computer, the more money you will save. So how did the SupraFaxModem perform in this all-important area? The answer must be "exceptionally well". When transferring an unarchived text file I managed to get average download speeds of around 3500 characters per second; on archived files (including binary, or program, files) a very healthy rate of 1650cps was achieved. One should bear in mind that my home system features a 68030 with lots of fast 32-bit RAM, so you may find speeds on a standard A500 or 600 are a touch slower, but the difference should not be substantial.

The fax side of the modem is very well implemented. You will, however, need to purchase the appropriate software for sending and receiving faxes, as none is supplied with the modem. For the purposes of testing the SupraFaxModem I made use of the *AmigaFax* demo, which was good enough for the job in hand. This isn't a review of fax software so I won't go into any real detail of the program at this point. At its simplest, sending a fax using your Amiga is a matter of typing a document into your favourite word processor. Instead of sending the word processor output to your printer, it is directed to the modem. The modem then sends the file to the fax number you have given the software. The big advantage over a stand-alone fax machine is that you don't have to print the letter from the computer and then feed it through the fax – it is all done from the comfort of your Amiga.



A lot of power in a small package – the modem itself is about the same size as a standard video cassette

There is, it must be said, one big problem with the SupraFaxModem and that is the fact that it does not currently have BABT approval. I am aware that many people use modems which are not approved, as well as phones and answerphones for that matter. However it is still illegal and cannot be seen to be condoned. If Supra could hurry up and get the approval through I would not hesitate to recommend the SupraFaxModem V32bis as the best buy modem available. Oh, what the heck! I *do* say the SupraFaxModem V32bis is the best buy modem available – just bear in mind the approval issue when you are considering the purchase.

OUR READERS SAY

So for sheer power and value for money the Supra cannot be beaten. Not only do you get one of the fastest modems available but you get fax as well! But don't just take my word for it, I asked some Amiga Shopper readers on CIX what they thought of it, and here are some of their comments:

- **Steve Goddard:** "I consider it to be well worth the money."
- **Matthew Likierman:** "It's good looking, small, sturdy, and does what I want it to do."
- **Francis Lock:** "My only grouse is that, being so small, it tends to disappear under the rubble on my desk!"
- **Jim Hawkins:** "It's very easy to use and very fast. The price/performance ratio is excellent. I don't think there is much around to beat it."

BUDGET ALTERNATIVES

If you can't quite afford the SupraFaxModem V32bis, then the SupraFaxPlus may be the answer. It is the same in most aspects to the V32bis model, except it does not feature the alphanumeric status display and the maximum speed is 2400bps (giving a throughput of around 9600bps with V42bis). The fax side runs at 9600bps rather than the 14,400 of the SupraFaxModem.

Dave Winder, (also known as 'Wavey Davey') is the moderator of the Amiga Conference on CIX. You can E-mail him as dwindera@cix.compulink.co.uk.

STOP PRESS – LATEST NEWS!

Literally as I write, I have been given permission to announce that CIX now has full Internet access available. The Internet gives access to thousands of online services across the world, from NASA databases to multi-user games, and of course thousands upon thousands of Amiga programs to be downloaded. I'm also able to announce the launch of a new multi-user game on CIX, the DiscWorld MUD. Based on the series of books by Terry Pratchett, and authorised by the man himself (who is also a CIX user, by the way), the CIX DiscWorld MUD looks like being one of the finest games of its sort available. It is certainly one of the most addictive.

There are to be no extra charges for either of these new services. You can find out more about CIX by ringing ☎ 081 390 8446 (office hours).

SHOPPING LIST

The SupraFaxModem V32bis costs £259.99
The SupraFaxPlus costs £139.99

From: First Choice
☎ 0532 319444
Prices include VAT and delivery

CHECKOUT SupraFaxModem V32bis

Ease of use ●●●●○
The easy-to-understand status display takes much of the mystery out of connecting with comms.

Performance ●●●●●
One of the fastest modems available.

Value for money ●●●●●
A super fast modem, and a fax machine as well. What more could you want?

Overall rating ●●●●●

If you are considering entering this fascinating area of computing, or if you want to upgrade to a faster modem, look no further than the SupraFaxModem V32bis. However, do bear in mind the legal aspects of non-BABT approval.

CHECKOUT SupraFaxPlus

Ease of use ●●●●○
As for the SupraFaxModem (above).

Performance ●●●○○
Only opt for this much slower speed if you really, really cannot afford the SupraFaxModem V32bis. The £120 difference is money well spent, and it is amazing how quickly you can get your money back by means of smaller phone bills.

Value for money ●●●●○
For the price, even allowing for the much slower speed, this still represents exceptional value for money.

Overall rating ●●●●○

A damn good buy if money is too tight to afford the SupraFaxModem V32bis.

COMING NEXT MONTH

In next month's issue I will be taking a look at the Internet: what it is, why should you want to use it, and how you get onto it.

And don't forget I will also be keeping you up-to-date with what is happening in the world of comms. See you then!

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AMOS Action

Jason Holborn answers more of your AMOS problems, brings you a feast of AMOS news and tricks and even manages to show you how to write 3D games – without using 3D graphics!

Welcome back to *AMOS* Action, the liveliest and possibly the fluffiest *AMOS* column you're ever likely to encounter. Fluffier than a mohair jumper washed in Dreft Automatic and more exciting than an installment of *Neighbours*, this is the place to be if you want to know what's hot and what's not in the world of *AMOS* programming. And what an exciting (and not to say fluffy) month it has been!

Hot on the heels of the launch of the new Amiga 1200 comes the news of an upgraded version of *AMOS Professional* – which Europress claim will allow *AMOS* programmers to take full advantage of the machine's exciting new screen modes. When I spoke to Richard Vanner, Europress' resident *AMOS* supremo, he assured me that Monsieur Lionet will be starting work on the upgrade as soon as he returns from his well-earned rest (let's face it, Francoise certainly deserves that rest after the sterling job he did with *AMOS Professional*). When the upgrade arrives, *AMOS* coders everywhere will be able to write arcade games and demos that take full advantage of the A1200's powerful graphic facilities. Just think, VGA-quality 256-colour and even VGA-beating 256,000-colour games will soon be within our grasp.

I should have my hands on a A1200 by the time you read this (that is, if that nice Mr Kelly Sumner gets around to sending me one!), so I'll be bringing you a full update as soon as the upgrade arrives. If you haven't yet upgraded to *AMOS Pro*, then do so now. Although the current release of *AMOS Pro* doesn't support the new screen modes, Europress assure me that existing users will be able to upgrade, so there's little point in hanging on for the new AGA-compatible release. Anyway, *AMOS Pro* is just tooooooo good to miss!

From what I understand, the *AMOS Pro Compiler* is also coming along quite nicely. The compiler, which is due some time in February (don't worry, you'll hear about it here first!), is a wee bit different to the original *AMOS Compiler*. Instead of all those fancy graphics which were lovingly crafted by Nic Wilson for the original release, the *AMOS Pro Compiler* will be far more integrated into the *AMOS Editor*. So you'll be able to edit, test, debug and compile your *AMOS Pro* programs without having to mess around with a separate accessory program.

Time for a quick tip. Those of you who have upgraded to *AMOS Pro* but still have the original compiler may be interested to know that it can still

"Just think, VGA-quality 256-colour and even VGA-beating 256,000-colour games will soon be within our grasp."

compile *AMOS Pro* code – providing the code doesn't use any of the new commands unique to *AMOS Pro*. You can make sure of this using the 'Check 1.3' option within *Pro*: if the editor tells you that your code is compatible with *AMOS 1.3*, then it will compile perfectly well under the

AMOS ANSWERS

If AMOS is causing you sleepless night, then write in to AMOS Answers. Jason Holborn, our resident night nurse, answers more of your problematic puzzles

CARD TRICKS

I am writing a program to deal playing cards with the help of *AMOS*. My code starts with the following lines:

```
Screen Open 1,640,200,8,Hires
Load IFF "df1:Pack.ABK"
```

The file 'Pack.abk' is a complete pack of 52 playing cards designed using Deluxe Paint. I then grab out each playing card in turn using the *AMOS* 'Get Block' command. Is there any way this picture file can be hidden from view whilst the program grabs the cards?

I also have another problem. As I add more lines of code to my program and then run the program to test it, the disk drive whirrs away and will not stop. Although this isn't too much of a problem, I'm worried about the life expectancy of my disk drive. Is there any way of storing this file in memory, and therefore prolonging the life of my disk drive? (The same file has to be loaded over and over again.) I suspect that these two problems are related, so I'd appreciate your answers.

Charles Murray
Eastbourne,East Sussex

You're making life very difficult for yourself by continuously loading the same picture file over and over again. A much better solution which would solve both your problems would be to use the *AMOS Sprite Editor* to cut out each card as an icon – which could then be pasted onto the screen using the 'Paste Icon' command. What's more, once the icon file has been loaded, it never needs to be loaded again because *AMOS* saves the icon bank as part of your program source code (the Load "Icons.bank" doesn't even have to be part of your source code – just enter it from direct mode and it'll be loaded and stored for good). This system is very similar to the blocks that you're using, but they aren't permanent – as soon as you run the program again, the blocks bank is cleared.

For your reference though, there is a way of hiding a screen once it has been opened. All you need to do is to include the line Screen Hide <Screen Number> to hide the screen and Screen Show <Screen Number> if you wish to bring it into view. I hope all this helps!

SWAP SHOP

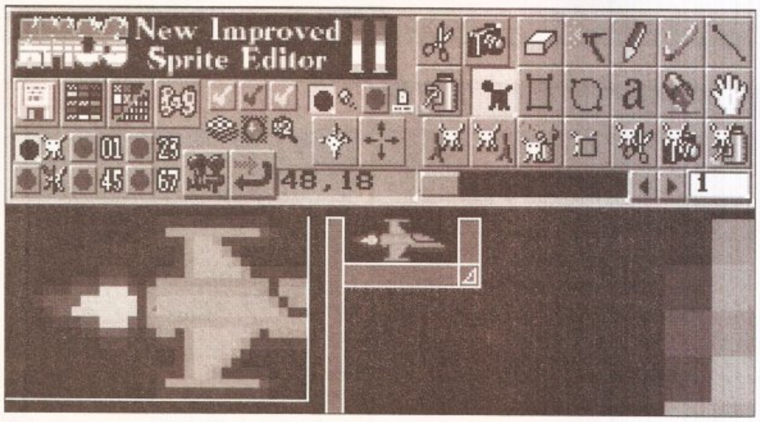
One of the reasons I buy Amiga Shopper is the *AMOS* column, especially the Beginners section. As a novice, I'm still having problems with the listing you

AMOS compiler. OK, so you can't use any of those wondrous new commands such as the *AMOS Pro* interface language or *Pro's* support for animation files, but at least you'll be able to get by until the full *AMOS Pro* compiler arrives. I'm sure too that Europress will allow existing *AMOS Compiler* owners to upgrade – if they don't, I promise you that I'll have a good old grumble in the Europress ear!

SPRITELY EDITOR

If the official *Sprite Editor* offerings don't quite meet with your approval, then look out for Nice Aardvaark Software's new *Sprite Editor Plus 2*, a dedicated sprite editor designed with *AMOS* owners in mind. Based around the best that both the standard *AMOS* and *AMOS Professional Sprite Editors* have to offer, Aardvaark's *Sprite Editor* claims to offer a smoother user interface than either, plus a few interesting innovations of its own. Here's a list of what it has to offer:

- **Colour Control.** See sprites as they will appear within your own programs using one of four sprite palettes or on a dual playfield screen. You can move the sprite around the screen with the mouse.
- **Size.** Edit sprite images of up to 320 by 200 pixels in size, regardless of the display mode.
- **Range Functions.** Some functions can automatically be repeated across a range of sprites. For example, if you define a range of images and a starting and ending size, *Sprite Editor Plus 2* can automatically scale the range of images inbetween.
- **Fonts.** Any standard Amiga bitmapped font can be used to add text to your sprites.



It looks good and performs equally well – that's the new *Sprite Editor Plus 2* from Nice Aardvaark Software

If this has whetted your appetite, then you can obtain a copy of the *Sprite Editor Plus 2* through Deja Vu Licenseware. Like all of Deja Vu's Licenseware products, *Sprite Editor Plus 2* costs £3.50. Failing that, you can obtain more information by contacting Nice Aardvaark Software (great name lads!) on 0294 63787.

CUBIC AREA

I rarely review or even mention demos within this column these days, but one demo which recently caught my eye was *Brain Damage*, from a very talented *AMOS* coder by the name of Cubic. Cubic's new demo features some of the most impressive *AMOS* tricks and techniques that I've seen for a long time – scrolling copper bars, high speed star fields, scrolling perspective chess boards and the obligatory unlimited bobs effect are only a small sample. What's more, Cubic assures me that the entire demo was coded in *AMOS* with not a single assembler opcode in sight!

Better still, Cubic very kindly supplies the entire source code to his demo on the disk and encourages potential *AMOS* coders to flick through his code to learn how it's all done. Straight 'ripping' of code is not encouraged, but Cubic is happy for you to use his code as the basis for a more advanced procedure. Good on you, Cubic!

You can obtain a copy of Cubic's excellent demo by contacting the *AMOS* PD Library at their usual address. If you want to see a damn good demo and learn a few new programming tricks to boot, then this is one I can thoroughly recommend.

TOP TIP

AMOS does a pretty good job of keeping everything running smoothly, but jitters can often be introduced when scrolling the screen – simply because *AMOS* continues to multitask even when your program is running. Although this multitasking support can come in very handy when developing software (did you know that you can swap back and forwards between *AMOS* and the Workbench by pressing [Left Amiga] + [A]?), these jitters can be a damned pain when writing high speed arcade games. Thanks to Laurie Lee in Irthlingborough though, you can kiss goodbye to those jitters forever.

Using the Exec library call Forbid(), you can turn off this multitasking support from within your *AMOS* code by including the line D=Execall(-132) at the start of your code. This will give you beautifully smooth scrolling, but it's important to note that this call also turns off *AMOS*' [Ctrl] + [C] handler, so make sure your program doesn't get stuck in a continuous loop. If it does, you'll be forced to reboot *AMOS*. Once the program has finished doing its stuff, you can turn multitasking back on again using the D=Execall(-138) call (that's the Exec library offset value for the Permit() function). Cheers Laurie!

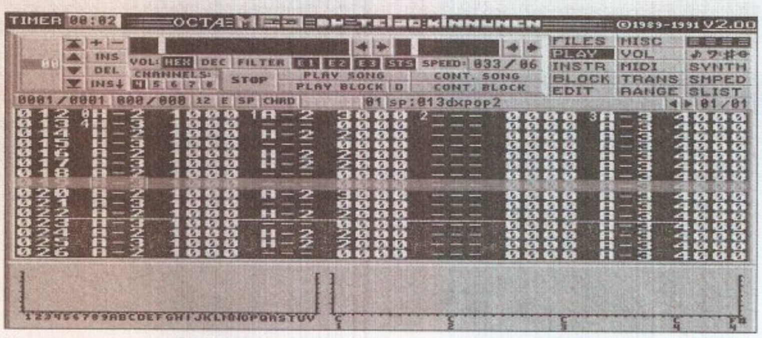
published in the October 1992 issue which demonstrates Screen Swapping. Although I've checked through the code, all I get is a Syntax error every time *AMOS* reaches the line Box COUNT-2,100 to. What am I doing wrong? I would be obliged if you could sort this problem out for me.

Also, is there a source of music modules that I can put into my *AMOS* programs? The only way I can get music to run is to use my A500 Plus upgraded to 2Mb, but they refuse to run on my daughter's 1Mb A500 because of memory problems. Do any PD libraries have some short music programs?

John Foley
Newton Abbot, Devon

You've stumbled across a problem that is shared by quite a few readers, John. Because of the size limitation of each column of text within the magazine (you'll notice that *Amiga Shopper* is based around what DTP experts call a 'four column grid'), it's not always possible to print source code without breaking longer lines into two. When this does happen, we indicate this break using an arrow symbol. When you see this symbol, it means that the line has been broken into two. You should therefore join this line with the line directly below it in order to produce a single line of *AMOS* code.

The easiest way to get original (small) modules into your *AMOS* programs is to write them yourself using one of the many *Sound Tracker* utilities that are freely available within the PD libraries. The one that I would recommend either *MED 3* or *Protracker 2.0*, both of which I use to write all the music for my *AMOS* games. When writing modules, try to restrict yourself to the smallest samples that you can. This will cut down the overall size of the module and will allow you to run your *AMOS* programs on your daughter's 1Mb A500. Both *MED 3* and Protracker 2 can be obtained from just about any good PD library.



If you want an original music score for your *AMOS* games, then you need a decent Sound Tracker program. Here's Teijo Kinnunen's excellent (and justly famous) *OctaMED* program strutting its sonic stuff

DEPECHE MODEM

How do I receive data via a null modem cable when programming in *AMOS*?

Paul Linsell
Gainsborough, Lincs

Simple – just use the *AMOS* serial commands which are held within the I/O extension. *AMOS* provides a wealth of commands designed to handle the task of communicating with other computers and devices via the serial port. Just use the Serial Open command to open the port and then send and receive data using the Serial Send and Serial Get commands. The speed, parity and number of bits used must be identical on both machines for connection to be made.

more AMOS questions answered on page 115

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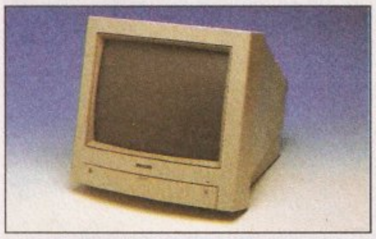
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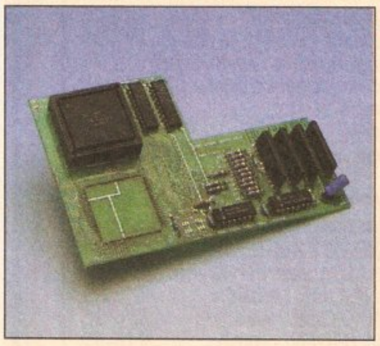
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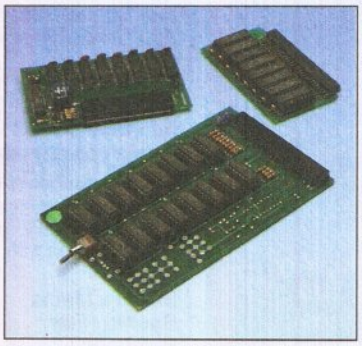
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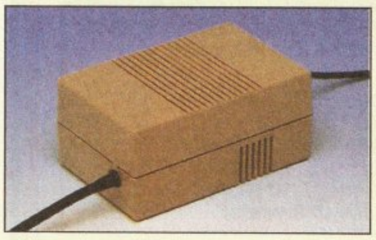
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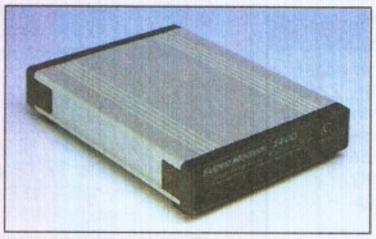
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GAMES PROGRAMMING

DUNGEON MASTER GAMES

Enter a shadowy world of three-dimensional dungeons where all is simpler than it first appears. Jason Holborn is your guide

We've covered some pretty heavy games programming tricks and techniques over the past few months and we certainly aren't going to be putting on the brakes this month. If you've mastered the *Maze Crazy* code that we covered two issues ago, then you'll be ready to transform that code into the next (third) dimension. Programming games such as FTL's Dungeon Master and SSI's brilliant *Eye of the Beholder 2* may seem an almost impossible task, but you may well be surprised to learn that they're actually very simple games indeed. OK, they look damned impressive, but the code required to generate those 3D displays is actually very straightforward.



With the techniques discussed here, you too will soon be able to write games that'll give SSI's *Eye of the Beholder 2* a fair run for its money

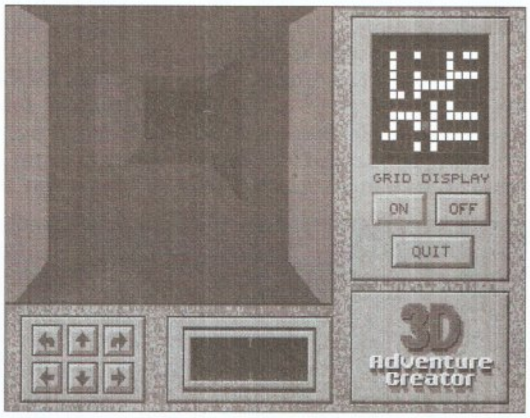
Don't worry if the thought of 3D graphics reduces you to a cold sweat – believe it or not, but there's virtually no 3D mathematics involved at all. Even more surprisingly, you don't even need *AMOS 3D* to write a *Dungeon Master* clone. All you need to get started is a copy of *AMOS* or *AMOS Professional* and *Deluxe Paint*. First though, let's explain how we adapt the *Maze Crazy* code to work in 3D.

3D MADE EASY

Although games such as *Dungeon Master* look very complex, if you study them very closely, you'll notice that the 3D display is actually very simple. All the walls, walkways and doors that you'll encounter in these games are actually made up of discrete graphic blocks. These are pasted down in the correct position to build up a 3D display. The actual 3D map data is held as a dimensional array – it's therefore very simple indeed to modify the *Maze Crazy* code so that instead of reading each 'block' in turn from data statements, the entire map is held in memory within a dimensional array. Say, for example, your dungeon was 100 by 100 blocks in size. All you would therefore need is a dimensional array created using Dim MazeData(100,100). Position 2,3 within the maze would therefore be held within the array at positions 1,2 – don't forget that the array actually starts at 0 and not 1, so it's necessary to deduct 1 from both the X and Y positions to find the data within the array!

So how do you go about drawing the 3D display? Well, this is just as easy. All you do is draw up a set of icons which represent each block as it would be viewed in solid 3D. This invariably takes a bit of playing around to get right – probably the best approach to draw up a 3D grid like the one shown on the following page. You can then cut out each section and draw it in as a solid object. All these wall parts can then be saved to disk, cut out within the *AMOS Sprite Editor* and saved as an icon bank.

To draw the 3D grid, you just interrogate the map data array to find



As they say in true *Blue Peter* fashion, here's one I created earlier. Although the wall graphics are currently a little basic, you could quite easily add a brick-work effect to each icon within *DPaint*

AMOS ANSWERS

GOT THE HUNCH?

I am attempting to write a *Hunchback* style game in *AMOS* but I have encountered a problem with the design and display of the game screens. I want my on-screen hunchback character to 'walk' along the floor, but to fall down any gaps. Is it possible for my hunchback sprite to check for the existence of a wall block? Will I have to program a massive set of co-ordinates into my program? Also, how do I go about displaying a single, static screen? If I use *DPaint*, obviously I can't check for the presence of a block and I can't find a memory-efficient way of displaying them.

Richard Palmer
Shirley, Solihull

I've never actually attempted to write a *Hunchback*-style game myself, although it shouldn't prove to be that difficult. The easiest (and possibly the most memory efficient) way of handling the various screens is to use the *Maze Crazy* code that was published two issues ago. Although it was designed specially for maze games, there's no reason why it couldn't be modified to handle the task you describe. You could then use exactly the same movement routines that were discussed in that article for the player's movement. it's not quite ideal, but it works!

I don't quite understand why you need to handle static screens within your game. Do you intend to use these for the game screens? If so, then you don't need to use them at all because the *Maze Crazy* routine will handle all your game screens for you. If you want to use them as a backdrop image, then the *Maze Crazy* routine will still work – just load in each picture and paste the icons straight on top of your image. If you only want to store one screen, then why not just use the *AMOS* Spack and Unpack commands to pack, store and then retrieve the image?

AMOS AGONY AUNT

Ok luvvies, so you say you've got a problem with *AMOS*? Will you do something for me luvvie? Will you please? What I want you to do is to put pen to paper and write to that nice Jason Holborn on Amiga Shopper. Don't worry, he's a very understanding chap who can help with virtually every aspect of *AMOS* coding. Will you do that for me luvvie? Send your problematic prose to:

Jason 'Clare Rayner' Holborn, *AMOS Action*, Amiga Shopper, Future Publishing Ltd, 30 Monmouth Street, Bath BA1 2BW.

out which blocks are empty, which blocks contain walls and which blocks contain doors. Doors are a strange case – while they are technically the same as walkways (in that you can walk through them), the 3D engine which constructs the display draws them first as solid walls and then pastes the door graphic on top of the wall icons,

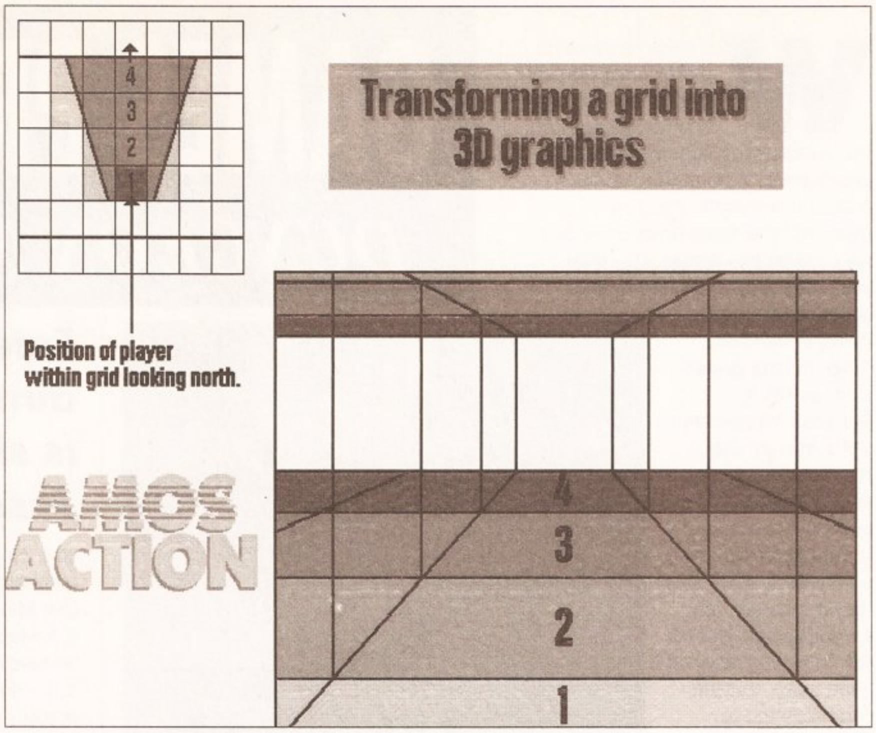
> **"...I almost had to slow the code down because the player was whizzing around the 3D map too quickly."**

therefore creating the illusion of a door. Clever really.

Of course it would be ridiculous to draw each and every block within the grid (after all, a 100 by 100 grid will contain 10,000 possible block positions), so you need to draw only those blocks that are actually visible.

As you can see from the diagram elsewhere on this page, in total only 15 blocks are actually drawn: five at the back, then another five, then another three and finally two at either side of the player's position. Not all these blocks will be directly visible – some will be hidden by other blocks appearing nearer to the player's position. To construct a realistic 3D display, the plotting of wall graphic icons must therefore start in the distance and then move forward. If an icon is drawn over the top of another icon, then that's the way it goes.

You could speed up your drawing routine by writing a piece of code that instructs the 3D engine to only draw those blocks that are visible, but the code required to do this tends to slow screen update still further. I've managed to get a very playable *Dungeon Master* clone up and running using the technique covered in the last paragraph and I can assure you that it's very quick indeed – because *AMOS* uses the Amiga's blitter chip to plot these icons, it's capable of drawing all 15 wall block icons in just 4 frames. And, as any games programmer will tell you, that's more than enough. In fact, it's so quick that I almost had to slow the code down because the player was whizzing around the 3D map too quickly.

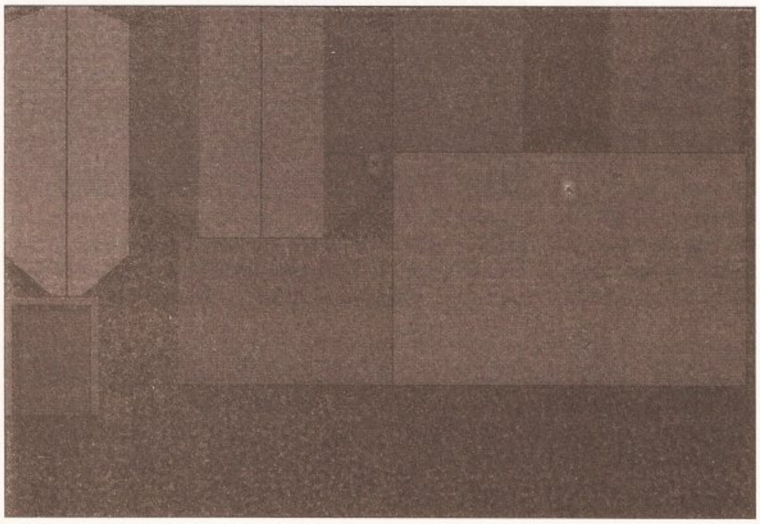


As the great Chinese philosophers used to say, a picture tells a thousand words – this thousand words of pixellised mastery demonstrates perfectly how the dimensional array is transformed into a 3D display on the player's unsuspecting screen

BALL BEARING

However, drawing the 3D display is only half the battle. Unlike the simple maze games that we covered two issues ago, the player doesn't just move up, down, left and right. Just like in the real world, a 3D game must also handle a bearing direction – that is, the direction the player is facing in. To keep things nice and simple, all we need are four bearings: north, south, east and west. As you'll no doubt appreciate, taking account of the player's bearing introduces another problem. To demonstrate this problem, consider the following. Will a player that is facing north move in the same direction as a player that is facing south when that player chooses to go forward? Of course not! Because the action of moving forward depends entirely upon where you are facing, a move forward in a southerly direction will produce exactly the opposite effect to a forward movement in a northerly direction.

To handle this, you need to create another dimensional array to hold another set of co-ordinates. These dictate the direction of movement according to the player's bearing. For example, to move forward a player facing north, the Y (up and down) co-ordinate would be decremented (presuming that position 0,0 is north of position 0,1) whilst the X (left and right) co-ordinate would remain unchanged. To carry out the same operation in a southerly direction, the Y co-ordinate would be incremented, therefore creating the opposite (but technically correct) effect.



Here's just one of the three *DPaint* screens which had to be drawn up to hold all the icons required for my game. Each and every block you see here was then cut out and stored as an *AMOS* icon

Believe it or not, but you now know everything you need to write a very simple *Dungeon Master* clone. OK, it's still technically not a game, which is why we'll be taking it one step further next month by covering the programming techniques needed to get monsters roaming around our 3D display. We might even chuck in a few static objects to be picked up and carried around by the player, and discuss the subject of handling locked doors.

With all this knowledge under your belt, there's no reason why you won't be able to churn out *Dungeon*

> **"...there's no reason why you won't be able to churn out Dungeon Master clones at a rate of knots!"**

Master clones at a rate of knots! And if you manage to get one on the market, please don't forget me – I'll expect a nice royalties check from every game based around my code. (I'm joking of course – though you can take me seriously if you're feeling generous!)

WHAT'S IN STORE FOR YOU NEXT MONTH...

OK, OK, I know that there's still no *AMOS* For Beginners section in this month's column, but I fully intend to correct that next month with a whopper of a section dedicated entirely to all you trainee *AMOS* coders. For the more experienced, I'll be continuing my look at writing *Dungeon Master* clones by adding monsters, objects and doors. And as if all this exciting stuff wasn't enough, I'll be bringing you another healthy bevy of news and juicy gossip from the world of *AMOS*. Can you bear the wait?

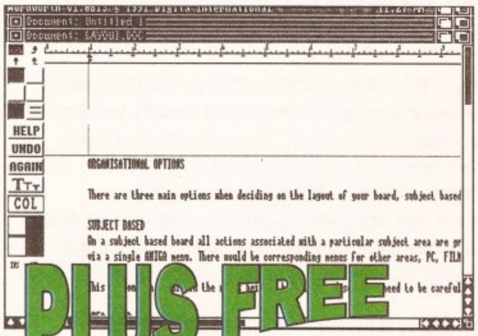
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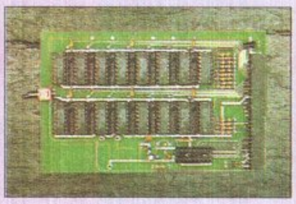
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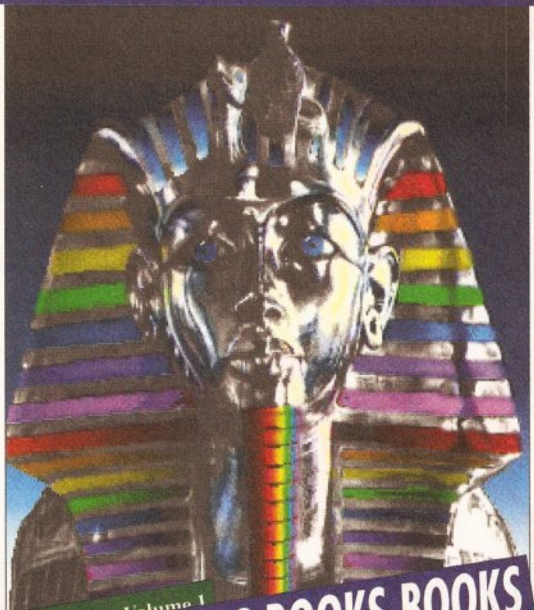
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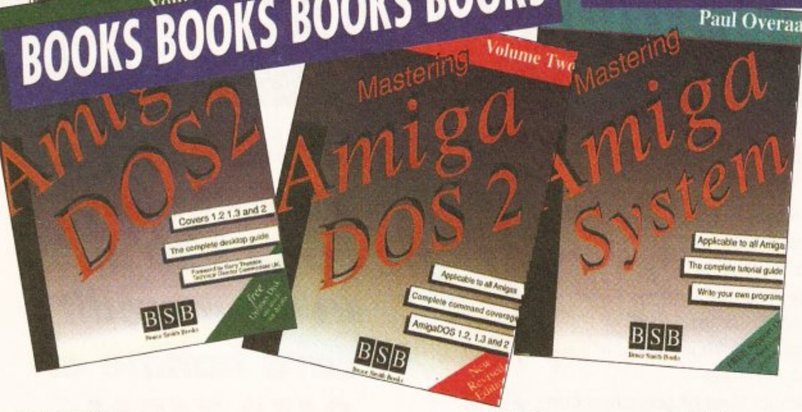
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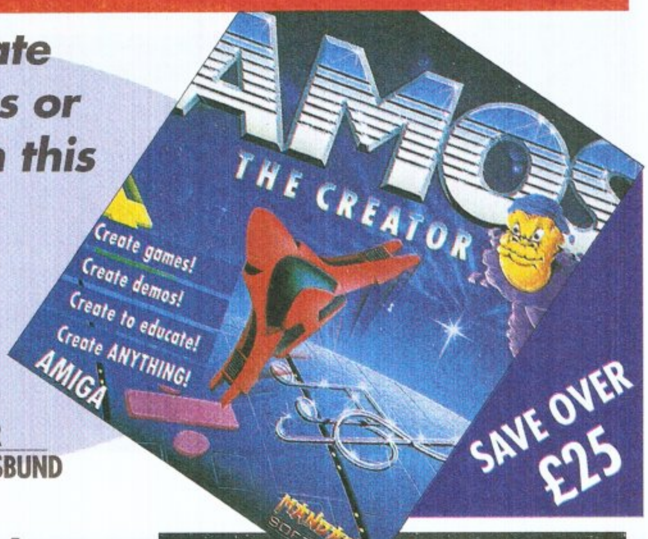
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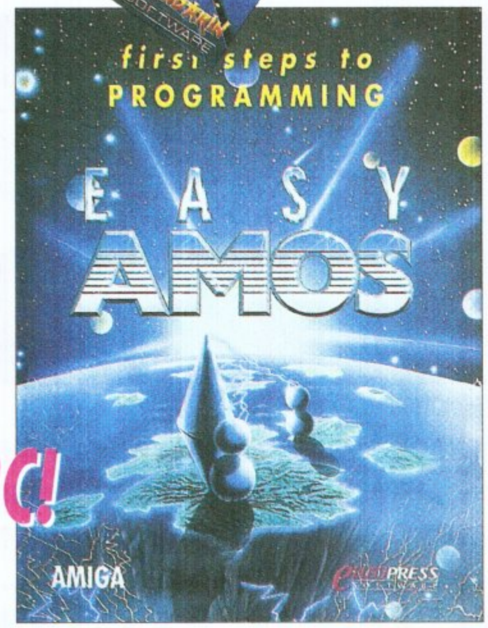
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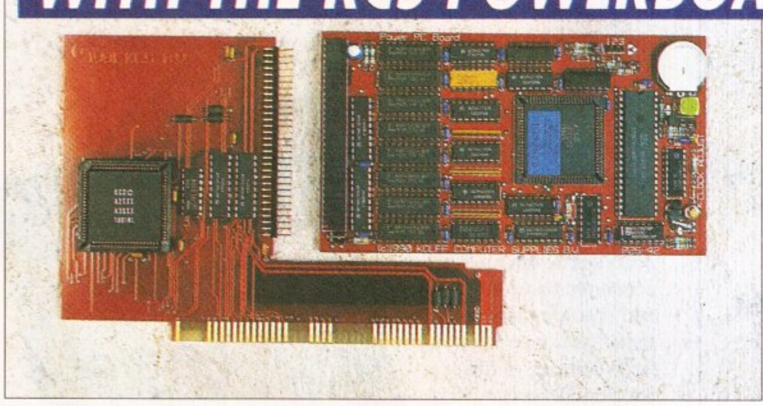


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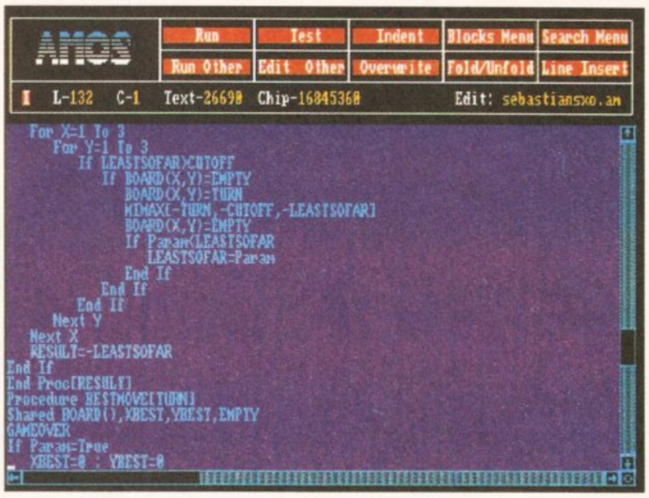
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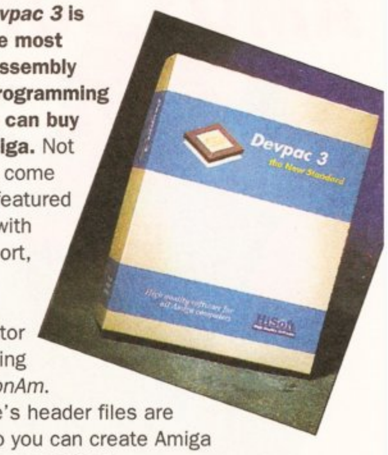
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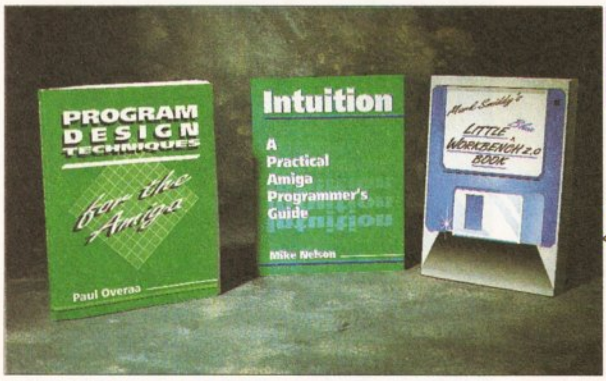
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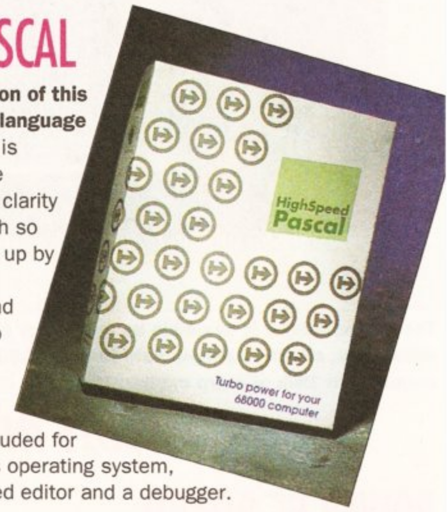
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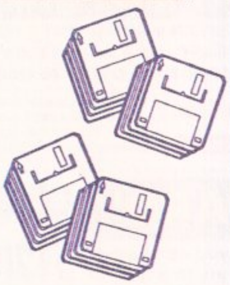
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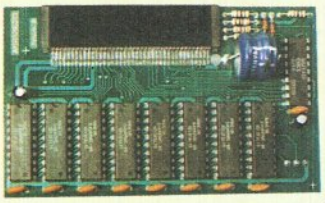
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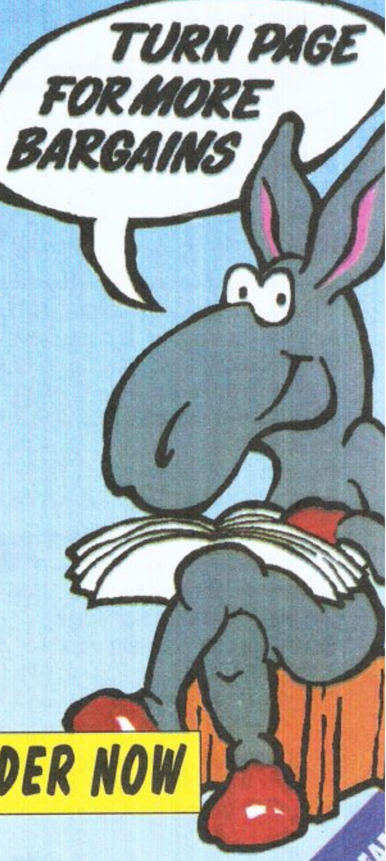
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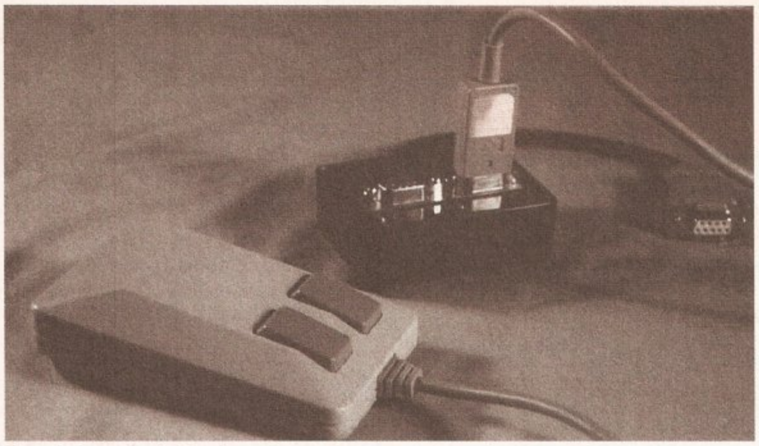
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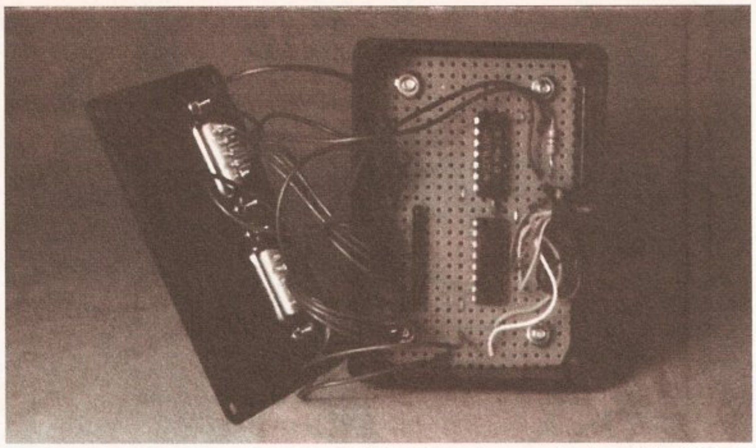
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AMITE BLASTS AWAY THE COMPETITION

3



Here it is – the finished product. The mouse plugs into one of the sockets on the box top, the joystick into the other. The box's plug goes to the Amiga



The circuit for the mouse-joystick switcher is really very simple, with all the components fitting on to a tiny piece of stripboard

SWITCH *that stick*

This month's hardware project comes from Steve Lewis, who explains how to build an automatic mouse-joystick switch for under a fiver

Here's another excellent hardware project that you can build with the minimum of fuss and expense. It's a device that enables you to plug both a joystick and a mouse into the same socket in your Amiga. The unit will automatically switch between the mouse and joystick, depending on which one is currently being used.

The project comes from Steve Lewis, who will be receiving £70 for his efforts. Steve reckons it can be built in two or three hours, but he advises that you proceed with patience to avoid causing damage to your machine. The total cost for the project, including the box in which it is housed, is around £5.

The basic idea is to prevent all of that irritating messing about with plugs that occurs when you've had enough of your word processor and decide a quick game of *Xenon II* is just what you need for relaxation. With Steve's device you can have both your joystick and mouse permanently connected, thus saving wear and tear on their plugs and the Amiga's socket.

THE BASIC PRINCIPLE

The switcher circuit constantly receives input from both the mouse and joystick. It must decide which of these two signals to send on to the Amiga. It does this by looking at the joystick signal. If the joystick is centred, then it is assumed not to be in use and the mouse signal is sent to the Amiga. If, on the other hand, the joystick is in any other position but the central one then its signal is relayed on instead.

HOW IT WORKS

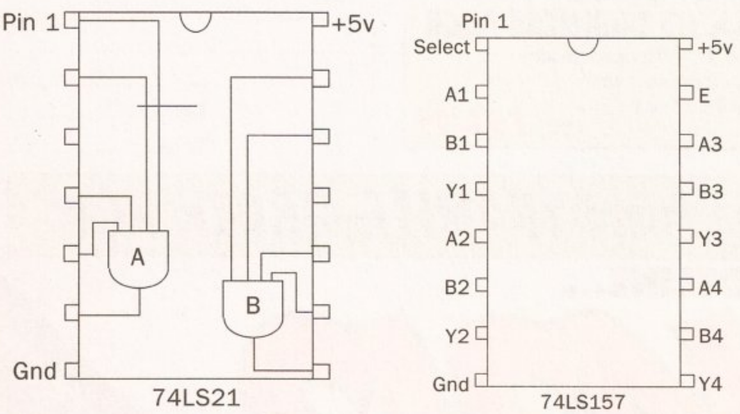
The components that do all the work in this project are two 74 series logic devices. The first of these, the 74LS157, is a quad, two in one, multiplexer. What this basically means is that it will take two sets of four inputs, and choose between these to give one set of four outputs. The inputs are labelled **An** and **Bn**, while the outputs are labelled **Yn**. Which of the set of inputs is output depends on the signal coming into the chip's **SELECT** pin.

The four mouse signals **V**, **H**, **VQ** and **HQ** are fed into the **A** input pins of the multiplexer, while the joystick signals **UP**, **DOWN**, **LEFT** and **RIGHT** are fed into the **B** input pins. The chip's output pins are connected to the joystick socket on the computer.

The second logic chip, the 74LS21, contains two **AND** logic gates. Those of you who program should be familiar with the way in which an **AND** gate works. It consists of a variable number of inputs and a single output. The output signal is always low unless *all* of its inputs are high, in which case the output too will be high. The 74LS21 contains two **AND** gates, each with four inputs.

The first of these is connected to the joystick signals. Its output will only be high if the **UP** signal *and* the **DOWN** signal *and* the **LEFT** signal *and* the **RIGHT** signal are all high. The Amiga's joystick uses an active low system, which means that if the joystick is moved left then the **LEFT** signal will be low, and the rest will all be high.

The net result is that the output from the **AND** gate will only be high if the joystick is in its centre position – when it is not in use. This output is fed to the **SELECT** pin of the multiplexer chip. So when the joystick is centred the **SELECT** signal will be high and the multiplexer will send the mouse signals (outputs **An**) to the computer. If the joystick is moved, then **SELECT** will go low and



Shown here are the two 74 series logic chips, along with their respective pin-outs. Care must be taken especially when connecting the power supply pins

LET'S BE CAREFUL OUT THERE

Just a few words of warning before you embark on your voyage of electronic discovery:

- **Disconnect your machine from the mains throughout this project.**
- ***Amiga Shopper* accepts no responsibility whatsoever for damage caused by you to your machine as a result of following these instructions.**
- **Chips are static-sensitive, so be sure to earth yourself correctly before touching them.**
- **Chips are heat-sensitive, so exercise extreme care when soldering. Don't let the soldering iron touch the pins for more than three seconds.**

the multiplexer will switch to sending the computer the four joystick signals (outputs **Bn**).

The other **AND** gate of the 74LS21 chip is used to combine the fire button of the joystick and the mouse's left-hand button. Remember that a high signal means that the button has not been pressed, so that if either the mouse or joystick button is pressed, the **AND** gate will give a low input – which will be the correct signal to send to the computer.

THE NITTY GRITTY

The circuit can be fitted on to a small piece of stripboard, around 70 by

> **"...you've had enough of your word processor ...a quick game of Xenon II is just what you need..."**

55mm in size. It's best, though not essential, to mount the chips in IC sockets, making them easier to replace if they are faulty.

The pins on the chips are numbered in an anti-clockwise direction, beginning with pin 1 at the top left (the top of the chip being denoted by a distinctive cut-out notch at that end).

The two logic chips get their power from the D-type connectors. The positive supply comes from pin 7 on the D-type connectors, and must go to pin 16 on the 74LS157 and pin 14 on the 74LS21. Similarly, the ground line comes from pin 8 on the D-type connectors and must go to pin 8 of the 74LS157 and pin 7 of the 74LS21. These connections are not shown in the circuit diagram (below) for the sake of clarity.

Once the power supply is in place, it is a simple matter of connecting the components together according to the circuit diagram. Refer to the diagrams of the chips to clarify which pins are which.

The resistors are used to pull the input signals high. It's best to use a Single In-Line resistor network for the eight main input signals. However, it is possible to use eight individual resistors, but these will take up more space and the stripboard will consequently have to be a bit bigger in order to accommodate them.

TESTING, TESTING

Once you've completed the soldering, it's a good idea to check everything over a few times. A mistake in the wiring could possibly damage your computer.

After that it's time to test it properly. Make sure your computer is switched off. Plug the circuit into the **JOY1** port of the Amiga, and the joystick and mouse into their sockets on the circuit.

Now switch on the Amiga and boot up with Workbench. If anything out of the ordinary happens at this point, switch off your machine immediately and check the circuit once more.

Once Workbench has loaded OK, centre the joystick and confirm that the mouse still moves the pointer around the screen. Next, move the joystick around and make sure that the mouse doesn't move the pointer while the joystick is in any position but the centre.

Now load a program that needs a joystick plugged into **JOY1** and check that the joystick works properly without interference from the mouse. When you are sure that everything is working according to plan, it's time to find a place to house the circuit.

THE HOUSING PROBLEM

The finished board can easily be fitted into a small plastic box. It looks reasonably attractive, and holes for the connectors can be cut in it with relative ease.

Alternatively, you could try fitting the board inside your Amiga's case. Bear in mind that doing so will void your warranty. Also, the **JOY1** connector will have to be removed, and you will have to cut a hole in the case large enough to enable easy access to both input connectors.

Well, that's all it takes – a fairly simple procedure, with simple but hassle-free results. There'll be another project for all you solder addicts next month. Until then, keep those ideas coming in. AS

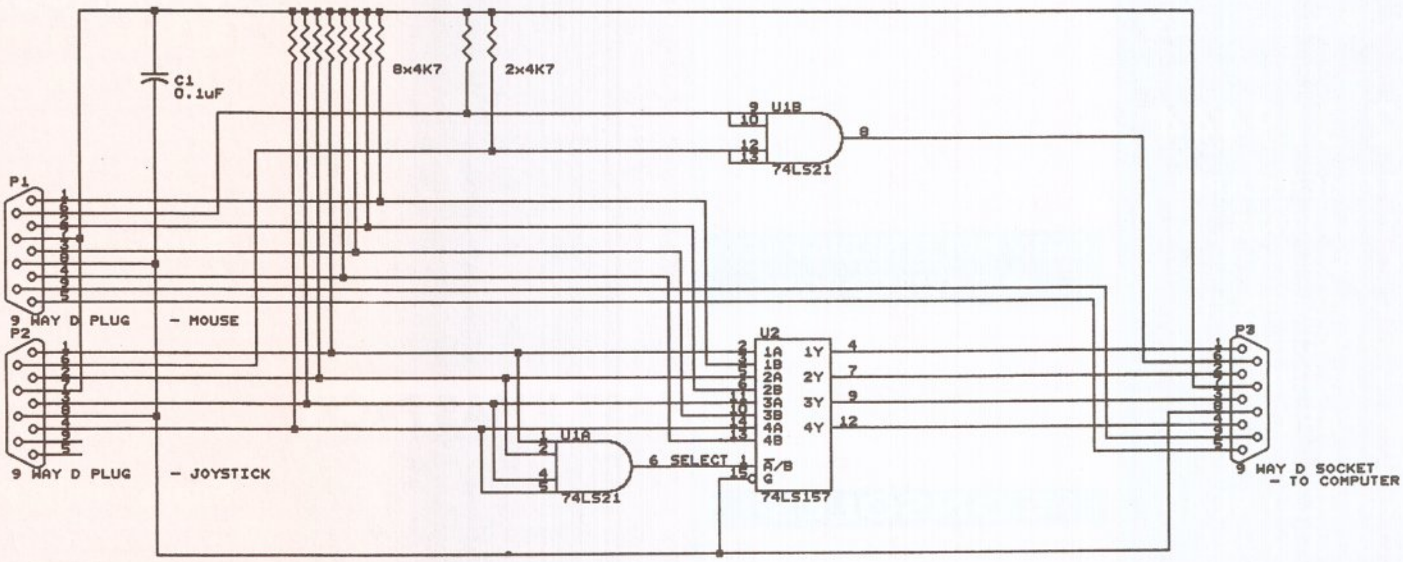
YOUR DIY PARTS LIST

To complete the project, you will need the following items:

- **A soldering iron, some solder, and something to hold components while you are working on them**
- **A 74LS157 logic device**
- **A 74LS21 logic device**
- **A 0.1 μF capacitor**
- **A 4K7 x 8 Single In-Line resistor array and two 4K7 resistors. Alternatively, you can use 10 4K7 resistors**
- **Two 9-way D-type plugs**
- **One 9-way D-type socket**
- **One 9-way cover**
- **20cm of 9-way multi-core cable**
- **A small plastic box**
- **A small piece of stripboard**
- **Some nuts and bolts for the case**

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This is the circuit diagram for the mouse-joystick switcher. The power line to the chips is not shown to keep the diagram clear, although it must be connected

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All monitors come complete with a free Amiga lead

WARNING: Before you purchase a monitor make sure it has a full UK specification. You might be buying what you think is a similar monitor at a lower price but it is likely to be a "GREY" import. These monitors do not comply with British safety standards and are not covered by an official warranty

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Colour stereo monitor. 600*285 line resolution, green screen facility, one years on site maintenance.
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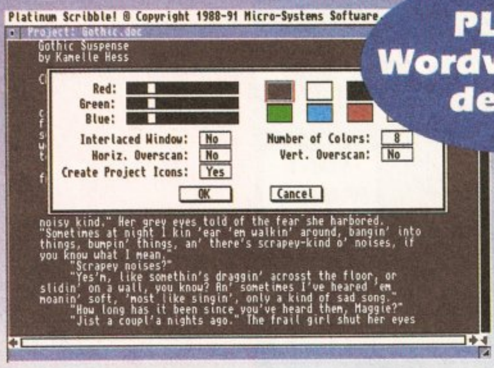
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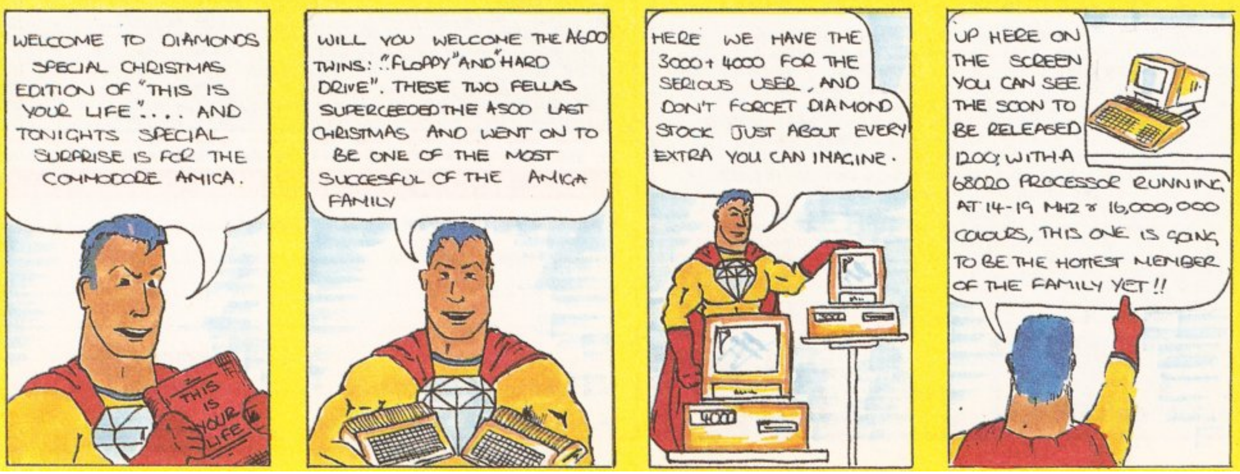
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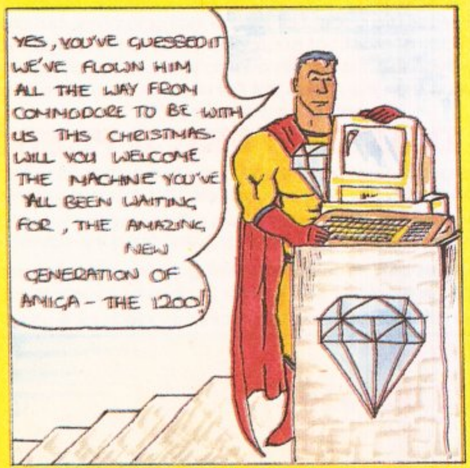
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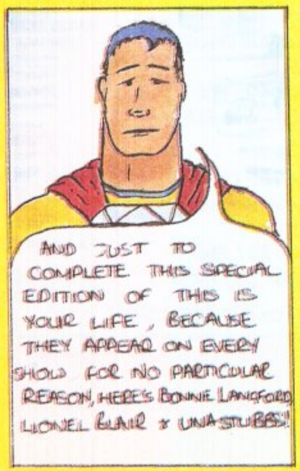
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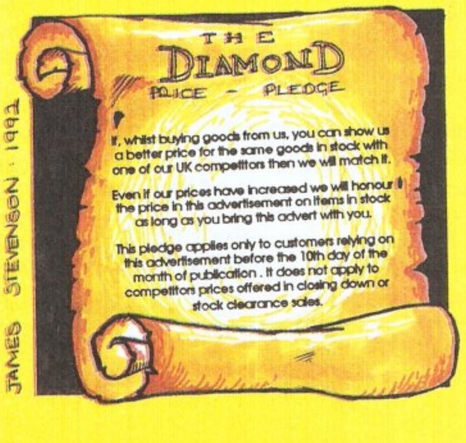
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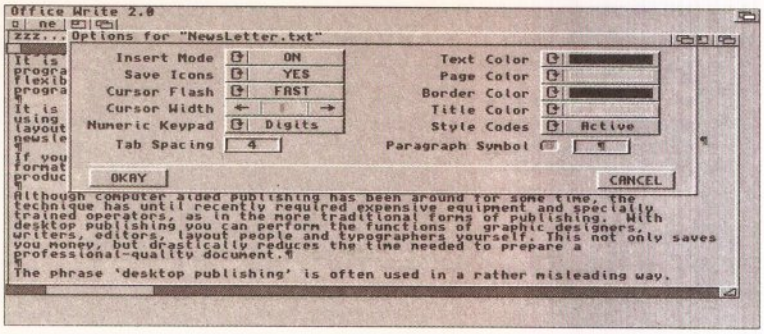
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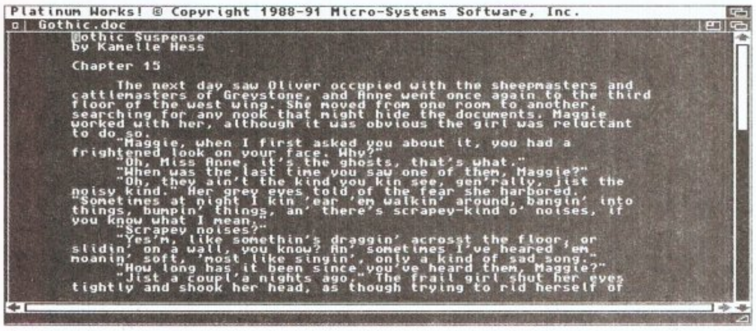
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You may have thought that one word processor would be very much the same as another, but you'd be wrong! *Office Write* (shown above)...



...has significantly more useful features than the older *Scribble* (shown here), which comes as part of the Platinum Works package

BUNDLES *of* FUN?

Mark Smiddy compares the top three integrated business suites to find out which is best for your working needs...

Time (and computers) wait for no man; since I last looked at integrated business systems, the software houses have made a few changes. Rather than reviewing the whole lot again, here is a condensed overview of what the top three have on offer. Previously, I have concentrated on the merits of each package as a whole, but this time I am comparing each module directly to see which performs best in each of the primary areas: word, data or numeric processing. In this way you can decide which module you will be using most, and therefore make a more informed choice. But do bear in mind that *Gold Disk Office 2* costs more than twice as much as the others.

WORD PROCESSING

Word processing is all about generating text. It could be anything from a letter to a report or even a complete novel. None of the word processors in this feature are special: all lack the absolute power of *Protext* and none have the document processing facilities of *Final Copy II* or *Wordworth 2*.

However, you must also ask yourself: "What do I want from a word processor?". If you need the ability to produce a simple document quickly, then the systems described here will suffice. In addition, they can also usually do it with more ease and speed than a typical document processor – which will spend a lot of time updating the screen. If, on the other hand, you want to produce letters with designs and fancy headers, logos and so on, you will need extra tools.

My overall judgement? *Office Write* wins by a short head over the older *Scribble* – with *Mini Office* coming a poor third. *Scribble*, despite being the oldest third-party word processor, continues to perform brilliantly. All the systems have similar mail-merge and formatting options, but *Write* lacks the ability to incorporate graphics in the final output – in a pure word processor this is not a flaw. *Write* comes out on top because of its added functionality – features such as "widow and orphan" control and automatic indexing set it well above the others. But why is there no facility to create a table of contents?

> **"The Mini Office word processor is, perhaps, best suited to beginners..."**

Speed is vitally important for professional writers and typists – not just typing speed, but the speed at which the word processor can move through the text, search and replace and so on. Here again *Office Write* leads the pack with *Scribble* making a fair showing. *Write* also has the best page preview, letting you 'live' scroll quickly through the document.

The *Mini Office* word processor is, perhaps, best suited to beginners whose lack of experience will ensure they don't miss anything; it also has the clearest WYSIWYG display. *Write*, with its Workbench 2 'look-and-feel' wins overall because of its speed and power – although I suspect some folk would find the external, 90,000 word spelling checker a bind and it does not have an integrated thesaurus – something which *Works* can offer over the other two.

THE A-Z OF BUSTING THAT BUSINESS PACKAGE JARGON

Application – Also called a package. A major program which fulfils a complete role in its own right. Word processors, databases and spreadsheets are all applications.

Criterion – A term used mostly in spreadsheet-based databases; used to select a set of records like a filter.

Database (1) – An application intended to organise data. The classic example is the computerised Rolodex or diary – where the database is configured to keep track of telephone numbers and addresses. However, Many modern databases can do much more than this: clever report generators can be used to make statistical analyses or to generate business invoices and statements. In the pure home environment it is difficult to imagine many truly useful applications.

Database (2) – The data held by a database application. Also called a database file.

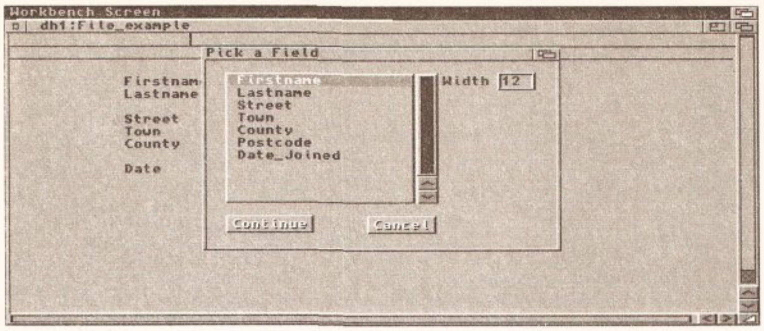
Field – Found mostly in databases (but also sometimes in more powerful spreadsheets), a field is a slot used to hold a single item of data (information). The vast majority of database applications support at least text and numeric fields although many have extensions to this.

Fieldname – The name of a field in a database record. Every field must have a unique name so it can be identified for later use. Typically, field names are allocated mnemonics such as: FIRSTNAME, LASTNAME, POSTCODE and so on. These names may or may not appear on screen.

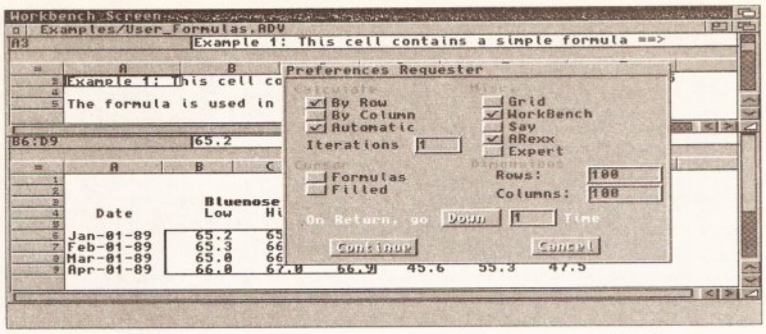
Filter – User-defined database formulae which instruct the application to select only records which conform to a set of criteria. A typical criterion might be: TOWN="LONDON".

Flat File – A type of database or database application where the records in one file must be accessed as individual items. It is not possible to build reports or filters based on two or more linked files. For most purposes, flat file applications are perfectly adequate provided they have enough field

Continued on page 140



Office File (here being used to create a report screen) is the easiest to use of the three packages on test. Handily enough, it's also the most powerful



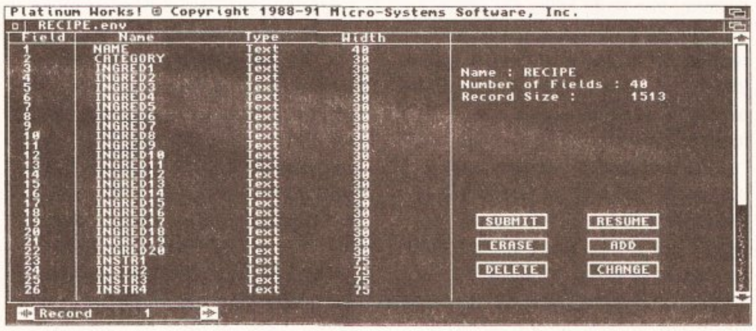
Office Calc isn't quite the perfect Amiga spreadsheet program, but has enough in common with *Professional Calc* to make it worthwhile

DATABASES

Database applications are curious beasts. In the home environment, most databases can have little use other than curio value. The idea behind databasing is an easy way to organise a large amount of information linked by a common subject. The key phrase here is "large amount" and this is where the "home" problem crops up. In truth, no matter which way you paint it, few folk have enough related data to warrant using a database. In the few obvious cases (such as a music or a video collection), refreshing the data (keeping it up to date) will often be just too time consuming.

Generally speaking, databases have to be maintained on a regular basis – typically every day or every week – although a lot depends on how fast the data being collated actually arrives. In a dental practice, the database might be updated as patients arrive for their regular treatment – so it could be on the go all day every day. A poll taken of cross-section of the population might entered all be in one go – by many typists on many different terminals. In either case, a large number of records are being handled.

There are three distinct areas to database use: definition, maintenance, and reporting. Defining the database should be simple – but more importantly it must be simple to add or remove fields at a later date. Maintaining the database is about adding and removing records. Several factors will be at work here, for instance, is it possible to define customised entry screens? Or, can the database be password protected for purposes of data security? Last but not least, reporting is most important. A database is effectively useless unless it has comprehensive facilities available to extract the required information.



The database supplied with the *Works* package isn't as friendly as *Office File*, but it can exchange files with the popular PC database program *DBase III*

Overall winner in this section has to be *Office File* – it is the easiest to use and more powerful than the others in all three areas. For pure business use, the *Mini Office* database (the only memory-based system) is a poor joke, leaving its comparably priced competitor, *Works Platinum* out in front. The *Works* database is nothing like as nice to use as *Office File*, but it does claim *DBase III* compatibility – which could be a prime consideration for those with a need to share data with PC-based systems.

SPREADSHEETS

Out of the all the main functions we're examining here, spreadsheets are the most complex business applications – simply because they require a certain amount of knowledge on the user's part. It's all very well for me to sit behind a keyboard with years of experience and prattle on about how amazing the new spreadsheet from XZY Inc is – but it will be precious little good to anyone unless they are prepared to learn at least the basics of spreadsheet programming.

Due to their inherent complexity, a good spreadsheet should make every function easy to use and all of the functions should work exactly as you'd expect them to expect. A beautiful example which springs to mind can be found in *Professional Calc*. When a date is entered directly into one of this spreadsheet's cells, the program computes an internal 'date number', enters that and sets the cell type to date – all without bothering the user.

I have already made my allegiance to *Professional Calc* clear and since *Office Calc* is a variation from the same stable it must win hands down – even though it isn't perfect. *Mini Office's* spreadsheet makes a wild stab at being cute – indeed for the money it isn't too bad – but is the more difficult to master. *Works* is much better. *Works* and *Office* both offer file compatibility, to some degree, with the popular *Lotus 1-2-3* (.WKS) file format. *Mini Office*, on the other hand, does not and this puts it out in the cold.

THE A-Z OF BUSTING BUSINESS PACKAGE JARGON (PART 2)

Continued from page 139

and reporting options; and that those options can be easily accessed.

Graphics – Graphing facilities are usually provided as part of a spreadsheet – although with some software they are accessed separately. Graphics are used to produce visual representations of data – after all, humans assimilate visual information more easily than lines of text.

Modem – A device used to link two computers together via a telephone line. The word is a contraction of Modulator-Demodulator – the method used to code computer data into a form that can be transmitted over the phone.

Orphan – A typesetting term to describe a single line of a paragraph left at the bottom of a page or column. Compare with 'Widow'.

Record – A collection of one or more fields in a database file.

Spreadsheet – Number crunching software. Spreadsheets are 'open' applications which must be programmed before they actually do anything. Spreadsheet programming, while simpler than conventional programming, is still an art which takes time to master. A typical home example is a sheet to predict electricity or gas bills.

Utility – A tool or support program. It may not do much in its own right but can enhance the usefulness or usability of another application or the computer hardware. Typical examples are sideways printing and graphics.

Widow – A single line or word stranded at the head of a page. Compare with 'Orphan'.

Word processor – Software used to generate and edit typewritten text and documents. Anything from letters to invoices and reports can be created. A good word processor will check your spelling, help with grammar and even improve your English. For most applications, a word processor without a printer is like a car without an engine.

WYSIWYG – What You See Is What You Get. The screen shows what will eventually be printed.

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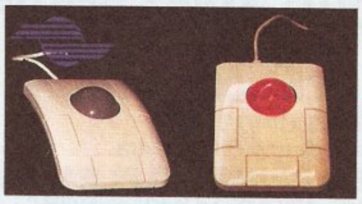
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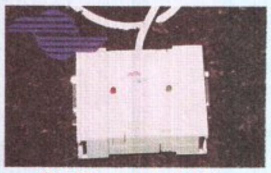
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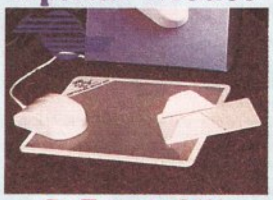
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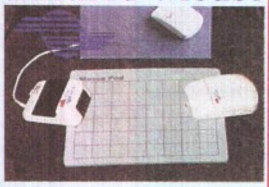


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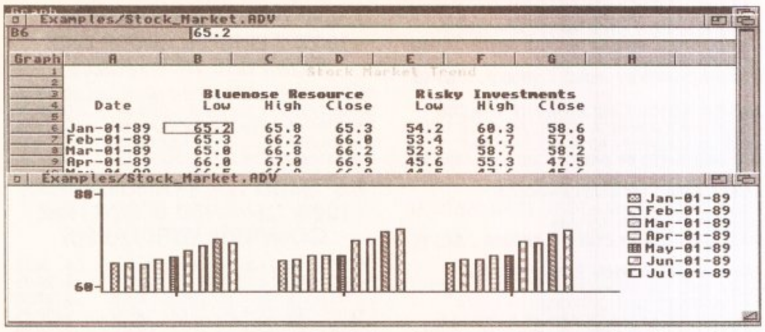
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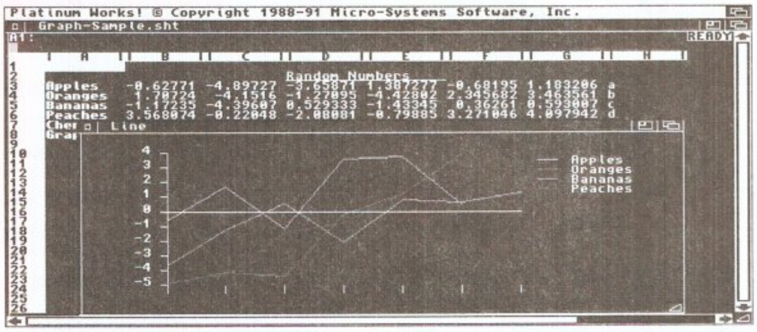
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Office Graph **(part of the *Gold Disk Office 2* collection) boasts 'intelligent' labelling of illustrations, taking text automatically from your headings**



The graphics facilities offered by the *Works* spreadsheet will certainly do the job, but they are beginning to look a little 'dated' by modern standards

GRAPHIC PROGRAMS

The best of which must be... *Office Graph*. Gold Disk gets it again, this time only beating *Mini Office* by a whisker. The thinking behind the two systems is completely different, but because it's spreadsheet-based, *Graph* receives the acclaim. Probably the most powerful of the three is *Works* but it is also the most difficult to use – since there is no automatic "here's some data, now just get on with it" option.

In *Office Graph* you simply highlight an area of data and the program does the chart for you – taking its labels intelligently from the row or column headings. This causes a problem when you want to chart data which is already surrounded by other data – the numbers appear as labels. In *Works*, every data 'set' has to be marked individually, and the data labels are then marked separately. There are arguments for and against each method – and my personal feeling is all spreadsheets should offer both variants.

In terms of speed and presentation – also hugely important – *Graph* is marginally the best in this area, with *Analyse* trailing a poor third. Although *Analyse's* graphics are clear they look unsightly and no amount of fiddling can overcome this. *Mini Office* is top here because you can drop an IFF picture in as a backdrop – ideal for slideshow and point-of-sale presentations.

EXTRA 'FREEBIES'

There's no overall winner in this category – it rather depends on what you want because each of these offerings comes with a different 'gimmick'. The freebies have been separated for this review since they are not strictly part of an integrated business system *per se*. That is not to that they are useless – but they should not be an absolute deciding factor in the final equation.

● ***Mini Office:*** Perhaps one of the more thoughtful additions to this little bunch is a suit of disk utilities which, although nothing like as powerful as *Directory Opus* or even *SID*, are still very useful for mastering the more common functions of AmigaDOS. Generally speaking this would be about as much use in a business environment as a rubber pencil, but for home users it's invaluable.

> **"...about as much use in a business environment as a rubber pencil..."**

● ***Works Platinum:*** This comes with two freebies, though one *(Sideways)* is more of an adjunct to the spreadsheet than a real accessory. More interesting is the neat little communications package. You'll need a modem to do anything useful with it, but this utility opens up a whole world of possibilities. All the basic functions are supported plus some more esoteric ones: it even has its own file transfer protocol.

● ***Gold Disk Office 2:*** DTP is something of personal preference – some people need this facility, others do not and this is what separates Gold Disk's *Office* from the others. *Office Page* is not the world's best example of a page layout application but it does the job.

Page is suitable for simple tasks such as flyers and posters, but the one Compugraphic font is a serious limitation. Also, in order to use this package to its best ability you will need a fast machine (68020 minimum) and preferably a flicker fixer; the new A1200 for instance. Consider *Page* as an introduction to page layout – it is by no means a universal typesetter's panacea. On the other hand you can treat *Page* and *Write* as the ideal document processor. Although a document processor would gives all the facilities in one, this way you get the speed of a word processor and the extra features of DTP.

THE FINAL SCORES

All things considered, *Gold Disk Office 2* tends to have the edge – but it does cost a lot more than the other two so you should expect it to perform better. Of the two budget packages, *Mini Office* and *The Works Platinum*, *Works* is far and away the better buy although the learning curve is steeper for most of the modules, and its circa 1987 vintage makes it look dated. This is something MSS should look into soon before the Europress offering overtakes it.

Regular readers may be wondering why I have apparently changed tack regarding *Mini Office*, but if you care to look back at the earlier reviews you will see this is not the case. *Mini Office* was, at the time of its release, a cost effective solution – with *Works* retailing at £30 more. With the recession biting hard, every penny counts – and the only fair comparison is to see what the two equivalently priced systems offer the potential buyer. As the systems stand at the time of writing, I can no longer recommend *Mini Office* as the best budget business buy – MSS must take the acclaim. Watch out for a price war soon... AS

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by Micro Systems Software

From: HB Marketing, Unit 3, Poyle 14, Newlands Drive, Colnbrook, Slough, Berks SL3 0DX
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Mini Office........................ £59.95
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From: Europress Software, Europa House, Adlington Park, Macclesfield SK10 4NP
☎ 0625 859444

Gold Disk Office 2 .... £129.95
by Gold Disk Inc.

From: HB Marketing, Unit 3, Poyle 14, Newlands Drive, Colnbrook, Slough, Berks. Sl3 0DX
☎ 0753 686000

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Works Platinum	●●●●○	●●●●○	●●●○○	●●●●○	●●●○○	●●●●○
Gold Disk Office 2	●●●●●	●●●●○	●●●●○	●●●●●	●●●●○	●●●●○

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A picture of chaos

You don't need to be a mathematician to produce a Mandelbrot pattern. Conrad Bessant explains the theory behind the world's most famous fractal generator

In 1980, Benoit Mandelbrot became the first person to see the pattern we now know as the Mandelbrot set. At the time, he could never have anticipated that his work would develop such a following. Mandelbrot's first plots were fairly poor monochrome print-outs, interesting not for their appearance, but for their relevance to pure mathematics. The Mandelbrot set epitomises a fractal, exhibiting all the interesting features such as infinite complexity and self-similarity, which we came across earlier in this series.

Like the Lorenz attractor which we discussed last month, the Mandelbrot set is based on a deterministic iterative process. However, the results of the Lorenz equations were drawn directly on to the screen as a graph, while the relationship between the Mandelbrot equation and the resulting set is slightly more involved. The traditional way of drawing the Mandelbrot set entails the use of mathematical inventions known as complex numbers. Complex numbers can be difficult to understand, so we will use a different method here, one which only involves a circle, a line, and some elementary maths.

MAGIC ROUNDABOUTS

The first part of the process takes place in the 'Mandelbrot circle', shown in Figure 1. This circle is of radius 2 and has its centre at (0,0). Inside the circle there is a single point, which starts off at the position (a,b) – a distance of 'a' in the horizontal direction and 'b' in the vertical direction. The following equations are then repeatedly applied to make the point move around in the circle:

```
pnew = p*p - q*q + a
qnew = 2*p*q + b
p = pnew, q = qnew
```

The variables p and q are used to store the horizontal and vertical positions of the point once it is moving. Another variable pair, pnew and qnew, is used to temporarily store the latest position during calculation. Both p and q are set to zero before the first iteration.

To see how the process works, we can perform a 'dry run' for one point. In this example our starting point will be (-1,0.5) – in other words, a = -1, b = 0.5. Recall that both p and q are initially set to zero, so, to start off with:

```
a = -1 b = 0.5 p = 0 q = 0
```

Apply the equation:

```
pnew = p*p - q*q + a
= 0*0 - 0*0 + (-1) = -1

qnew = 2*p*q + b
= 2*0*0 + 0.5 = 0.5

p = pnew, q = qnew
```

So the first position is (-1,0.5), which is the initial point (a,b).

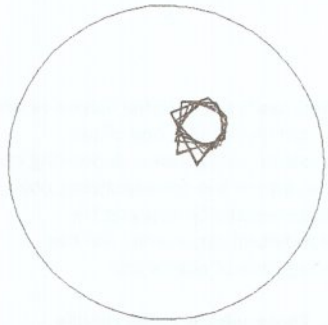


Figure 1: A point which stays within the circle we have created

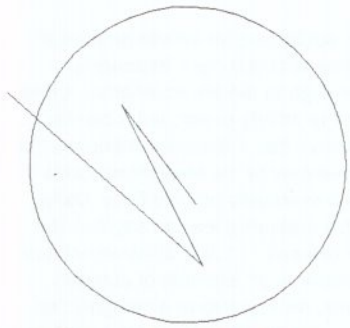


Figure 2: This point, on the other hand, quickly leaves the circle

The next step is for the equation to now be re-applied:

```
pnew = p*p - q*q + a
= (-1)*(-1) - 0.5*0.5 + (-1)
= -0.25

qnew = 2*p*q + b
= 2*(-1)*0.5 + 0.5 = -0.5

p  = pnew, q = qnew
```

The point has moved to (-0.25,-0.5).

Only two iterations have been performed here, in order to demonstrate how the equations work. Had more iterations been carried out we would have obtained the following results:

Iteration: 0	p = 0.0000	q = 0.0000
Iteration: 1	p = -1.0000	q = 0.5000
Iteration: 2	p = -0.2500	q = -0.5000
Iteration: 3	p = -1.1875	q = 0.7500
Iteration: 4	p = -0.1523	q = -1.2813
Iteration: 5	p = -2.6184	q = 0.8904

These results are reminiscent of those produced by the virus equation which we met earlier in the series: they are very complex and appear to be almost random. In fact, the results are not random as they come from a deterministic process, which will give the same values if repeated.

Using only a table of numbers like this, it is difficult to spot trends and patterns. It is much more useful to plot the path of the point in the circle, which results in the image shown in Figure 1. This type of output can easily be achieved on the Amiga by calculating the values of p and q (in other words, the position of the point) for successive iterations, and then drawing straight lines between these positions. An Amiga BASIC program to do this is shown in Listing 1. Note that the iteration count is displayed in the top left of the screen to show just how many calculations are taking place.

ETERNAL TRIANGLES

The program automatically stops when the point leaves the confines of the circle. Checking whether the point is outside the circle is done mathematically, using a technique known as Pythagoras' theorem. The diagram shows that if (p,q) and (0,0) are taken as being two corners of a right-angled triangle, then the distance between these two corners is equal to the length of the triangle's longest side. This length (we'll call it r) can be calculated from the length of the other two sides using the Pythagoras' theorem formula, which is r*r = p*p+q*q.

LISTING 1

```
DEFDBL a,b,p,q,pnew,qnew
INPUT "a:",a
INPUT "b:",b
CLS
CIRCLE (260,90),200
p=0
q=0
iteration=0
PSET(320+a*100,90-b*50) ↲
'Plot initial point
WHILE p*p+q*q<4 ↲
'Check for stopping
conditions
  pnew=p*p-q*q+a
  qnew=2*p*q+b
  p=pnew
  q=qnew
  LINE -(320+pnew*100, ↲
90-qnew*50) 'Draw line ↲
to next point
  iteration=iteration+1 ↲
'Increment iteration ↲
count
  LOCATE 1,1
  PRINT ↲
"Iteration:";iteration
WEND
```

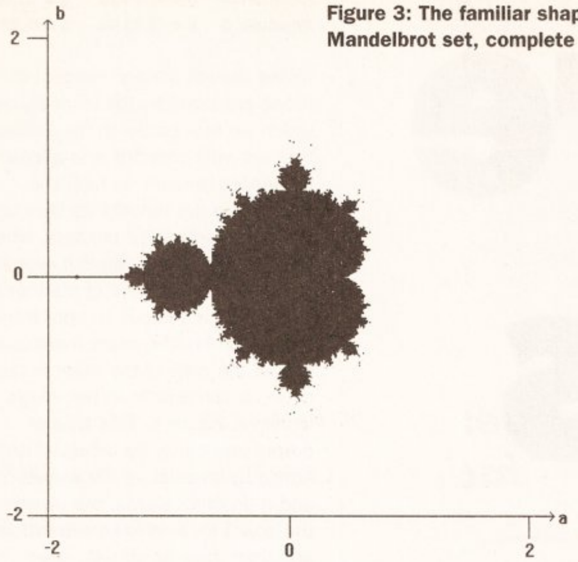


Figure 3: The familiar shape of the Mandelbrot set, complete with axes

If the point (p,q) is inside the circle then it is impossible for this length to be greater than two (so r<=2), which gives p*p+q*q<=4. It is this final form of the equation which is used in the WHILE line to check whether the program should end.

Because the range of values for p and q is so small the plotting co-ordinates must be significantly amplified in order to make full use of the screen. This accounts for the large multiplication factors in the PSET line of Listing 1.

THE MANDELBROT SET

Much can be learned from watching the line in the circle, and you may want to spend some time experimenting with various initial positions of the point, but how does this relate to the Mandelbrot set?

LISTING 2

```
DEFDBL a,b,p,q,pnew,qnew
FOR a=-2 TO 2 STEP .01
FOR b=-2 TO 2 STEP .02
    REM Set initial ↵
values of variables
    p=0
    q=0
    iteration=0
    REM Begin ↵
calculation loop
    WHILE (p*p+q*q<4) ↵
AND (iteration<32)
      pnew=p*p-q*q+a
      qnew=2*p*q+b
      p=pnew
      q=qnew

iteration=iteration+1
    WEND
    REM Plot the point ↵
if it is of type one
    IF iteration<32 THEN
      PSET(320+a*100, ↵
100-b*50)
      END IF
    NEXT b
NEXT a
```

Well, each set of initial values (a and b) can be put into one of two separate categories – depending on the path of the corresponding point, as generated by applying the Mandelbrot equations. The two categories of points are:

1. **Those whose paths rapidly accelerate to infinity**
2. **Those whose paths never leave the confines of the circle**

It would take an infinite amount of time to test a point thoroughly enough to determine whether it flies off to infinity or not, but it can be shown that if the point breaches the boundary of the Mandelbrot circle it will eventually reach infinity. Using this reasoning we can say that the initial point (-1.5,0.5) demonstrated earlier is an example of category one. An example of a category two point is (0.35,0.35), whose path is shown in Figure 2; this was tested using Listing 1 and had still not exited the circle after 20,000 iterations. Unfortunately there is no simple way to prove that a line will not reach infinity, so the brute force method of applying the equation many times must be used. When plotting the Mandelbrot set the number of iterations after which we terminate the process and assume the point will never leave the circle (the iteration ceiling) is arbitrary, but ceilings of 32 are generally typical (if the iteration ceiling is too high the program will be excessively slow, but if it is too low the edges of the set will not be sufficiently detailed).

MAKING A POINT

The categorisation of points according to their behaviour in the circle is the key to creating the Mandelbrot set. What we do is to take every point with initial position between a = -2, a = 2 and b = -2, b = 2, put them through the equations and then categorise them. If all the type two points are left black and all others are coloured white we get the image shown in Figure 4, commonly known as the Mandelbrot set. An Amiga BASIC program which produces a similar plot is given in Listing 2.

Note that not every value of a and b can be tested because there are an infinite number of values, meaning that they would take an infinite amount of time to process and they would not fit on the screen. Instead we plot a small portion of regularly spaced samples, allowing a reasonable approximation of the Mandelbrot set to be built up. The actual number of points tested is determined by the distance between them – in Listing 2 this is the STEP size of the FOR...NEXT loops. This distance is optimised to give the maximum detail in the smallest amount of time.

A BIT OF COLOUR

Technically the Mandelbrot set is defined as the map of all the category two points on the plane (in other words, all the black points shown in Figure 3), but most people are more familiar with the version surrounded by colourful curved lines. These lines are known as contour lines (or dwell bands), and represent the ease with which each point left the circle. Listing 2 can easily be adapted to display these contours. The colour of each point is determined by the number of iterations performed before the point escaped (the fewer iterations it took the more easily this happened).

In the Amiga's high resolution non-interlaced mode we can determine the colour by taking MOD 16 of the number of iterations required to free each point from the circle. This gives a range of colours between 0 and 15. Obviously colours are repeated, meaning that no one colour can be assigned to any single iteration number, but the colour cycle ensures that no two adjacent contours are the same. The iteration ceiling of 32 ensures that all members of the actual Mandelbrot set are left black in line with conventions (32 MOD 16 = 0).

To add colour the following two lines must be inserted at the head of Listing 2 in order to open a screen capable of displaying 16, rather than the usual four, colours:

```
SCREEN 1,640,200,4,2
WINDOW 2,"Colour Mandelbrot
Set",(0,0)-(617,180),15,1
```

To actually plot the points in colour the IF...END IF section of Listing 2 should be removed, and the following routine substituted in its place:

```
COLOR iteration MOD 16
'Set colour
PSET(320+a*100,100-b*50)
'Plot point
```

When plotting a Mandelbrot set to a monochrome monitor or printer the contour boundaries can become indiscernible due to the substitution of grey scales for colours. In this case the simplest thing to do is change the MOD 16 to MOD 2, so that contours are coloured alternately black and white.

THE WAITING GAME

The majority of Amiga Mandelbrot programs take the best part of 15 minutes to produce the whole contoured set, although exact times depend on things as the programming language used (Amiga BASIC Mandelbrot programs are much slower than GFA BASIC or C ones) and the screen resolution (the higher the resolution, the more points there are to test and plot).

You should now be able to appreciate why Mandelbrot generators take so long – remember that for each point on the Mandelbrot set the program must determine and categorise the behaviour of the corresponding line in the circle. If we assume that on average 16 iterations are required to categorise each point, and that the size of the relevant screen area is 400 by 200 pixels then altogether 400 by 200 by 16 = 1,280,000 iterations must take place. That's 1,280,000 applications of the equations, the circle breaching test and all the associated program instructions. This is a clear demonstration of why a powerful computer like the Amiga is essential for chaos research.

Of course, not all points require the same number of iterations. If you observe the contour drawing version of the program in action you can easily spot the changes in calculation speed. This is most noticeable in and around the actual Mandelbrot set, where more iterations must be performed per point than anywhere else.

So, we've seen how to create the basic Mandelbrot pattern – without recourse to complex mathematics. Next month we'll be taking a look at how to zoom into the set and I'll be providing some extra information necessary to produce some rare Mandelbrot mutations.

This series of articles uses information from Conrad Bessant's forthcoming book, Computers and Chaos: Amiga Edition. For details of price and availability, you can call Sigma Press ☎ 0625 531035 or fax 0625 536800. Conrad Bessant can be reached by E-mail as ppyhcmb@uk.ac.nott.vax.

A GRAND Improvement

It sounds too good to be true: an upgrade which gives the A1000 the same facilities as the A500 and A2000 – and more. Farrukh Alavi tests the Phoenix

The Phoenix board, from Australian company Phoenix Microtechnologies, is the latest and greatest upgrade for the die hard A1000 user. Much more than a simple enhancement, it is an entire motherboard replacement which not only brings the A1000 into the ECS/Kickstart 2+ era, but also offers facilities not found on either the A500 or A2000 machines alone.

Few computers invoke the sense of loyalty that the Amiga does. In an industry where last year's technology is already out of date, even fewer computers can boast the longevity that the original Amiga A1000 has enjoyed as a usable system.

It is estimated that Commodore sold over 200,000 A1000s before formally discontinuing the series. Much new technology has since been incorporated into the mainstream Amigas that has left the A1000 user behind. For instance, the A1000's Agnus, limited to 512K of chip RAM, came in a 48-pin DIP form factor, making it impossible to upgrade to the Fat and ECS Agnus parts (offering, respectively, 1 and 2Mb of chip RAM), which have an 84-pin PLCC packaging.

Commodore also began work on the Kickstart 2.0 ROM, which requires 512K of ROM space; the A1000 design provided only a 256K area of memory (the Writable Control Store, or WCS) for ROM storage. This was one of the unique features that was unfortunately done away with in later Amigas – it allowed the user to load in different Kickstarts from disk, thus making devices like ROM switchers unnecessary.

The first A1000 enhancement product designed to overcome these limitations was the Rejuvenator from US-based Expert Services (as reviewed in *Amiga Shopper* issue 3, July 1991). The Rejuvenator is a board for those A1000s which house their WCS in a daughterboard assembly (called the 'Kickstart ROM Tower'); it cannot be used with later A1000s which put the WCS onto the motherboard itself.

A second similar product, the DVS-wonder card, was also announced more than two years ago. Just like the Rejuvenator, it was supposed to offer ECS and Kickstart 2.0 compatibility; unfortunately, it never reached the market.

The Phoenix board, on the other hand, is available now, though currently lacking a UK distributor. So, could this the add-on that every A1000 owner has been waiting for?

PLUGGING AWAY

Installing the Phoenix board can take anything from one to several hours, depending upon which features you want to give the A1000. It is likely, however, that most people who purchase the board will want to install at least a hard drive and a de-interlacer card, which is the configuration we will discuss here.

Disassembling the A1000 and removing its RF shielding and motherboard are relatively painless operations. The Phoenix manual gives complete instructions, including details of how to find difficult-to-reach screws. At this point it becomes necessary to check three things, which should really be done beforehand by anyone who wishes to order this board:

1. If the 68000 CPU is of Hitachi or Thomson manufacture, it is advisable to obtain a Motorola one, otherwise overloading problems may occur when using the SCSI controller or the expansion bus.

2. If the floppy disk connectors are soldered to the motherboard (as in some PAL machines), a Soldered Connector Cable Set has to be ordered from Phoenix to enable their use with the Phoenix board.

> *"...the latest and greatest upgrade for the die hard A1000 user."*

3. If the disk drive itself is an NEC or Matsumi brand, it will leave no gap between itself and the ROMs (which sit just under it) for the motor to rotate. Phoenix can supply a replacement drive for this purpose.

There are five chips on the A1000 motherboard that need to be removed and inserted into the Phoenix board, namely: the 68000 CPU, the two 8520 CIAs, Paula and Denise (or ECS Denise). The 68881/68882 maths coprocessor (which, incidentally, requires the purchase of an oscillator chip for its use) and the Kickstart 2.0 ROM also go into their respective sockets. (The

JARGON BUSTER

DIP – (Dual In-line Package) Rectangular-shaped computer chips, with pins along both lengths.

PCB – Printed Circuit Board. The large flat item inside your Amiga which all the electronics are attached to.

PLCC – Square-shaped computer chips, with pins along all four sides.

SCSI – Small Computer Systems Interface.

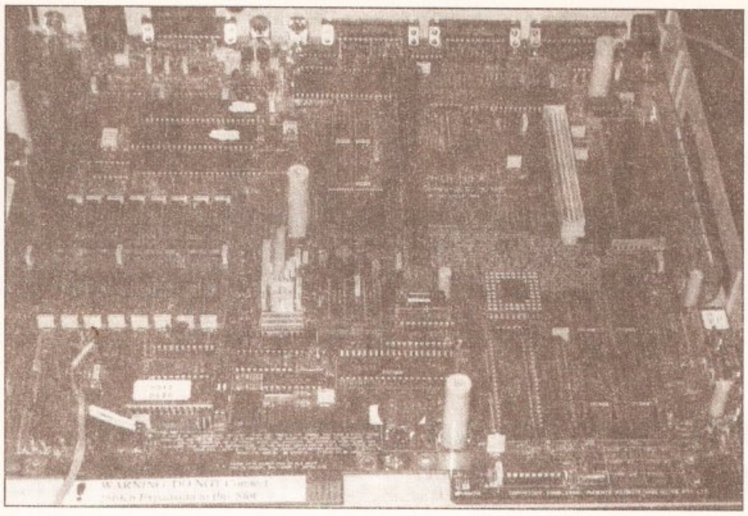
Zorro – The name of the Amiga's expansion slot protocol. The Zorro I was unique to the A1000 and the A500; Zorro II was then introduced with the A2000 and Zorro III made its debut on the A3000.

CHIPS FOR EVERYTHING – THOSE PHOENIX FEATURES IN FULL

Revolutionising what you can do with an A1000, the Phoenix board offers the following:

- Full ECS support, with both 1 and 2Mb Agnus versions available. (The 1Mb version is upgradable.)
- Sockets for holding four Kickstart ROMs simultaneously, with the ability to switch between any two of them at a time. The ability to load Kickstarts from disk is planned as a later upgrade.
- Comes with 1.3 ROM and 2Mb of motherboard RAM pre-installed.
- Audio filter and real-time clock built in.
- One A2000 compatible Zorro II slot and one A2000/A3000 compatible video slot available on the motherboard.
- Socket for installing a 68881/68882 maths co-processor.
- Internal RS-232 connector, similar in concept to that found in A2000s (mostly used for fitting internal MIDI interfaces). The pin-out, however, duplicates the A1000 serial port.
- Internal SCSI port. As far as possible, the SCSI controller emulates Commodore's A2091.
- Preserves all connectors at the back of the machine, for complete compatibility with A1000 peripherals – although the composite colour connector now supplies only monochrome video.
- Eliminates the need for a front panel 256K RAM connector – this port is left free for future expansion peripherals.

The construction is modular: all chips are fully socketed for easy replacement, and most Phoenix functions (such as selecting the Kickstart ROMs, or booting from an external drive under 1.3) are activated by setting appropriate links on the board. The product itself is subject to improvements; ours was version 1.4, incorporating a SCSI Revision 1 driver EPROM.



Installing a new Amiga motherboard always involves a fair degree of internal modification. But if you're determined to broaden your A1000's horizons, the Phoenix board is well worth the effort!

Phoenix board has seven sockets to hold various Kickstarts: ROMs 1 and 2 are intended for 1.3 and 2.0 Kickstarts, ROM 3 is spread over four sockets into which Kickstart 1.2 and earlier EPROMs can be inserted, and ROM 4 is a 2 megabit EPROM connector intended for custom or future 1Mb Kickstarts.) The Phoenix manual stresses the importance of proper grounding when handling these static-electricity sensitive devices. Certain modifications will need to be made to the A1000 case at this stage, allowing Kickstart-floppy drive select switches, external SCSI/serial connectors and de-interlacer card monitor cable connectors to be made available at the back of the machine. The Phoenix board can now be inserted into the A1000 case, with some effort being required to match up the joystick ports and align the back panel at the same time.

ADDING YOUR ADD-ONS

The final stage in the installation procedure is the fitting of an internal hard drive and a de-interlacer card. Given the lack of a hard drive bay in the A1000 case, this entails carrying out some serious surgery on the top RF shield. Phoenix supplies a template for fixing Quantum LP (Low Profile) series SCSI hard drives inside the A1000. These drives are available in 50, 105 and 210Mb versions. Although other SCSI drives will work internally with the Phoenix board, this would render the supplied template useless. This template is required in order to cut out a rectangular section from the top of the RF shield, slightly larger than the area occupied by the Quantum. Phoenix recommends the use of the so-called 'nibbling tool' from Tandy for this purpose – this, too, is available from Phoenix themselves.

In practice, the use of the nibbling tool is the slowest process in the installation exercise – it removes an area of approximately 2 by 5 mm from the metal at a time. Once the hole is complete, it is advisable to file the edges to remove any rough spots – the manual insists that this should be done away from the board, to prevent any pieces of metal from finding their way into it. The Quantum then fixes to the RF shielding via screws, using mounting brackets which are part of the hard disk installation kit.

> **"In a sense, the Phoenix board is the first 'Amiga clone'..."**

The Phoenix board has two identical internal power connectors (the original motherboard had just one) for supplying power to the internal floppy and hard drives. (Having both a hard and a floppy drive drawing power from the motherboard is not the problem here that it would be on an A500 – the A1000 power supply has a reasonably high rating.) The board also has two internal hard drive data connectors. One of these (a 50–pin header) hooks up via a supplied ribbon cable directly into the Quantum, which must be configured via its jumpers as SCSI device zero; the other, a 26-pin header, connects to an A3000-style DB-25 SCSI connector which is mounted externally on the A1000 case.

FIXING THE FLICKER

Phoenix also supplies an internal display enhancer template for Commodore's A2320 board, as well as one for the German MultiVision 2000. No template is supplied for the Microway Flicker Fixer, but since this does not handle PAL or overscan modes, in any case its usefulness is limited. Both the A2320 and the MultiVision can rest horizontally inside the A1000 case using right-angled brackets. The video slot supplies all the signals that are found in the A2000/A3000 implementations, an improvement over the similar slot found on the Rejuvenator (which, in addition to not supplying the audio and parallel port signals, was let down by the A1000's inability to generate analogue composite sync).

In principle, therefore, it would be possible to use cards like NewTek's Video Toaster and GVP's IV-24 with the Phoenix board. Note that installing the A2320 requires modification of its PCB – a template is provided for this task, which can be performed with the nibbling tool; alternatively, Phoenix can supply modified A2320s. In the end, the display enhancer and the hard drive end up snuggling extremely close to each other if the RF shield is to go back on at all.

TIME TO OPERATE!

Once the hard drive and the display enhancer have been installed, it is important to test the machine thoroughly before sealing it together one last time; you wouldn't want to open it up again without very good reason. Given the high quality of the construction, it was no surprise to find the Phoenix-Amiga combination worked perfectly first time.

A utilities disk supplied with the package includes various useful tools for testing and using the Phoenix board. One of these is a version of Commodore's *HD ToolBox* utility program, which is used to prep and format the internal Quantum hard disk. With the supplied **pbscsi.device** driver installed in the DEVS: directory, both the Quantum and an external Fujitsu SCSI unit connected to the external SCSI port were immediately recognised by the program. The Phoenix board SCSI controller fully implements Commodore's Rigid Disk Block and SCSI-Direct protocols for hard disks. A **pbscsi.amhd** driver is also included on the utility disk for use with the AMAX II Mac emulator.

One of the problems that plagued all A1000s was signal noise on the 86-pin expansion bus connector, which led to frequent crashes as soon as an external device was plugged in. The Phoenix board expansion bus is noise-free. Like the original connector, it is almost identical to the A500 expansion bus. It worked fine with an A1000 memory expansion board, as well as with A500 peripherals, such as Datel's Action Replay III cartridge. It even worked perfectly with an A590 hard drive plugged in, which had no problems co-existing with the internal and external SCSI units – but you can thank the Amiga AutoConfig architecture for this flexibility.

THE DREAM MACHINE

The Phoenix board is an excellent product. It incorporates in one unit the best features of the A500, the A1000 and the A2000. It turns the A1000 into the only Amiga with both a Zorro I and a Zorro II bus, giving it the ability to use both A500 and the A2000 cards simultaneously. (Note, however, that due to space constraints, it is not possible to have a Zorro II card plugged in without leaving the case open.) In use, this does not simply feel like a new machine, this *is* a new machine. In a sense, the Phoenix board is the first 'Amiga clone'; much like PC clone motherboards, it would not be unfeasible to install it into one of the cheap replacement cases widely available in the PC world.

Phoenix's support and service are also highly commendable. Available from them soon will be an internal 8Mb RAM expansion board with built-in IDE hard drive controller (*à la* A600HD), which will plug into its own presently-unused slot on the board. Phoenix also assures compatibility with the large number of 68030 accelerators for the A500, such as CSA's Mba Midget Racer. There is also no reason to believe that the A570 CD-ROM drive will not work with the Phoenix board. In fact, with a hard drive, an accelerator, a display enhancer, an A2000 card and multiple Kickstart ROMs installed internally, together with the A570 and a freezer cartridge sharing the expansion bus, you get a multifaceted Amiga which an A500 or A2000 alone would have difficulty in matching. *Vive la A1000!*

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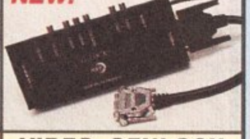


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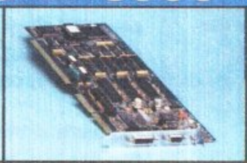
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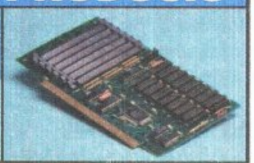
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Getting into gears

Wilf Rees shows how Imagine 2 can be used to illustrate the insides of a working vehicle. PLUS: a new program that teaches the time

In last month's issue we covered the design and construction of an off-road buggy, presenting our final design using a 3D modelling package. Communication of your ideas is essential in technology, _Imagine 2_ being a powerful tool for achieving such ends.

Having illustrated the overall aesthetic design of the buggy, we need to show the internal workings in order to establish how the vehicle works. The best part of the buggy to illustrate this is the gear mechanisms that are needed in order to produce the right amount of torque. If you examine your buggy, it's clear that there is a definite need to show the internal workings, as otherwise people will only be able to see the plain outer shell. You can play around sketching some ideas out, but how are you going to show your design and movement of your mechanism before building your mock-up? Simple! All you need to do is to construct a model on *Imagine 2*. The software package contains all the facilities to produce gears, axles, push rods and such like. We will start with a simple gear.

GEARING DOWN

Let's say that your buggy is designed for climbing hills, so the speed of the motor will have to be 'geared down' before it reaches the wheels in order to gain some torque and bring the speed under more control.

First of all, do a few rough sketches of the layout of the gearbox in your buggy. The wheels on each side of your buggy (or caterpillars) may be driven independently for steering, in which case you will need two gearboxes. However, for simplicity, we will assume that you have only one gearbox in your buggy.

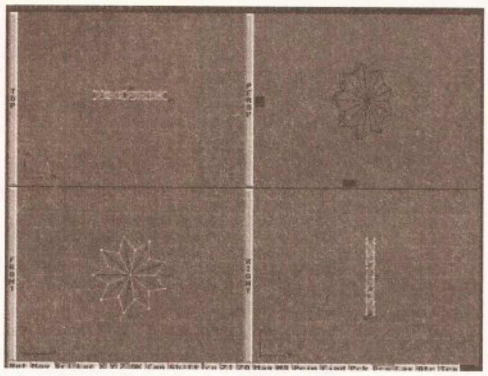
THE COG

As even the most amateur engineer will know, the basic part of any gearbox is the cog. The following steps illustrate the construction of a simple gear wheel with nine teeth.

1. Load up *Imagine* and enter the Detail editor.

2. Create a 'tube' primitive of radius 50, height 10, 18 circle sections, and 1 vertical section. Don't select the 'stagger points' option, but do tell *Imagine* to have both ends of the object closed.

3. Select this object and enter 'select points' mode. Change the pick method to 'drag box'. Now, while holding down the [Shift] key, pick every second point around the circle and click on 'scale'. Turn off the Z axis scaling so that the width of the cog does not alter while you 'pull in' the selected points to create the teeth of the cog. Note that this cog has nine teeth.



Once the inner points have been selected, they may be scaled down over the X and Z axis to create the teeth of the cog

You can change the amount of teeth that this cog has, but do remember to save it first, making a note of the amount of teeth it has. For example, you can give the cog a name from the attributes section, including the number of teeth. So, for future reference this cog will be named 'COG-9'.

4. Now you will need to construct a cog with a different amount of teeth, to be driven from the first cog you have created. Since our buggy is to be a hill-climbing vehicle, a large amount of gearing down is needed. The driven cog therefore needs to have a larger amount of teeth than the driver cog (the 9-tooth wheel you have just created). So, if we want to achieve a gear ratio of 1:2, the second cog needs to have twice the amount of teeth as the first. This means that the second will be rotating at half the rate of the first, given that the size of the teeth are the same. The equation is:

Teeth 1 : Teeth 2
= 9 : 18

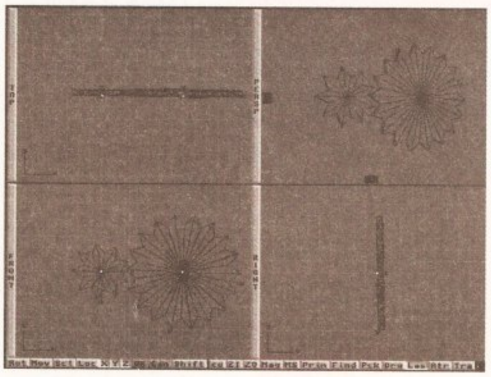
which simplifies to

1 : 2

One important factor to take into account is that the teeth sizes on both cogs need to be the same in order for the mechanism to work successfully.

5. Your second cog should be created by selecting a tube with twice the radius of the first cog, twice the amount of circle sections, 1 vertical section, points not staggered and both ends closed.

6. Repeat the same procedure for creating the teeth as used before.

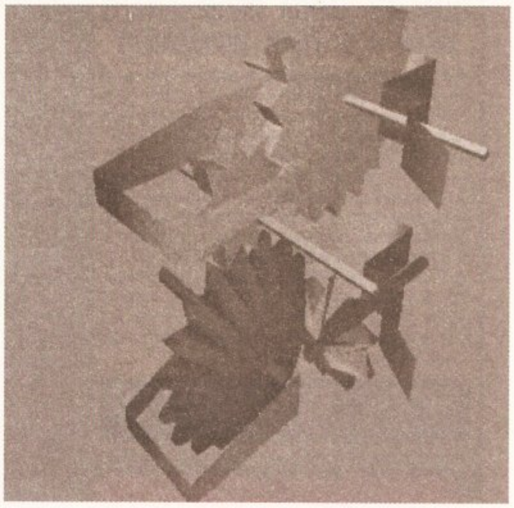


Both cogs are aligned to see whether the teeth are the correct size for proper biting

7. Place these two cogs side by side so that they can 'bite' into each other, enabling you to judge whether or not the teeth will fit together. Name the new cog 'COG-18'. Save it, once again including the number of teeth in the filename.

MOVING STUFF

We now have two cogs, which we can use to gear down the motor revolutions to the wheels. So, how do we view these cogs in action?



Here is a very creative 'Heath Robinson' style gearbox that actually serves no real purpose other than to look impressive!

1. Enter the Project editor and create a new project. Name it 'Mechanism'.

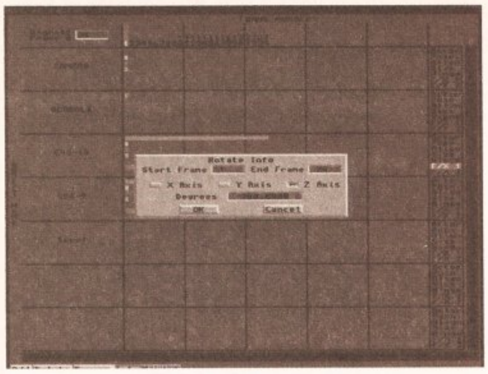
2. Enter the Stage editor and set out your two cogs, so they are in a position to bite into each other. This sets out the cogs ready for you to animate them. Save your changes and enter the Action editor.

3. Set the frame count to 24. Click on the 'actor' bar for each cog and lengthen their stay for all 24 frames (start frame 1, end frame 24). Select 'add' from the menu and add the 'Rotate2.0' effect to COG-9. When the requester appears for you to alter the effect, select rotating around the Z-Axis and set the rotation degrees to 720. Add another rotate effect to COG-18, except this time set the degrees of

JARGON BUSTING

Primitive – The most basic shape used in a 3D rendering program. Shapes that fall into these categories are cubes, spheres, and such like.

Rotational Symmetry – An object with rotational symmetry will look the same if rotated around an axis.



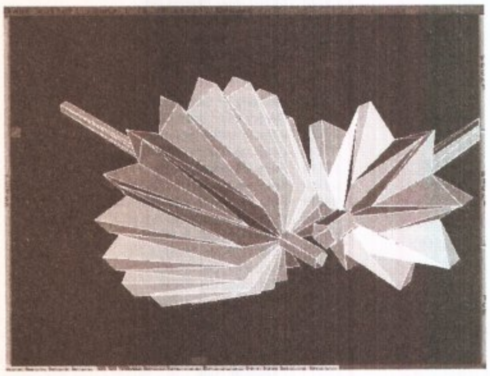
The rotate value may be changed from 360 to 20 degrees, as this is the rotation needed to achieve rotational symmetry. Remember, if this cog is changed to 20 degrees rotation, COG-9 needs to be changed to 40 degrees

rotation to -360 around the Z-axis. (The value of rotation is half the previous amount because COG-18 rotates at half the speed.) Save the changes and enter the Stage editor.

4. Look through your frames to check that all the movement in the animation is correct, then go to the animate menu and select 'Make'. This will then create a small wire-frame animation of your two cogs working against each other. You could go to town and ray-trace the entire sequence.

ROTATIONAL SYMMETRY

Every cog is rotationally symmetrical, with the lines of symmetry occurring on every tooth. This means that if your animation consists of just cogs rotating, you can set the overall rotation to a factor of 360 degrees. For instance, you could change the rotational value for COG-18 to 20 degrees and the rotational value for COG-9 to 40 degrees. This implies that COG-18 possesses rotational symmetry every 20 degrees. We get this figure by dividing 360 degrees by the number of teeth on the wheel: 360 / 18 = rotational symmetry every 20 degrees.



This is an example of one bevel gear driving another, at an angle of 90 degrees. This is probably the most common way of transferring drive from a given direction to another

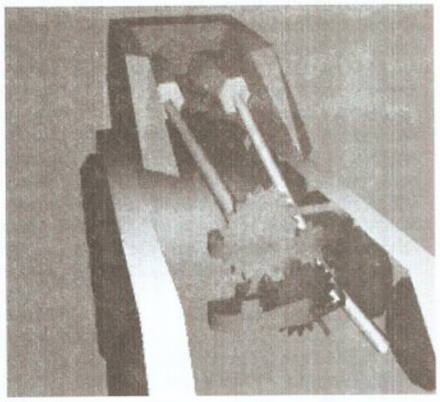
COG CONFIGURATIONS

Cogs may come in any size with any amount of teeth, but how do you alter the axis of the rotation? A bevel gear! This type of cog has its teeth set at a bevelled angle, so that two of these types of gear may be set at 90 degrees to each other.

A bevel gear is an adaptation of a normal gear, so you can start with one of the normal gears that we prepared earlier in the Detail editor. Looking at the normal gear from the right view, you will be able to see just the edge of it. Select 'hide points' mode, set the pick method to 'drag box' and hide one side of the cog on this view. You should now have a cog shape that has no depth. Using the other view you will need to select all of the points that you pulled inwards to make the teeth. Scale these down slightly (to about three-quarters of their original size) then pull this entire ring of dots outwards, away from the plane they once sat on, and through the rotational axis of the cog. (in relative terms, about half the radius of the circle of points that you have just shrunk.) Select 'pick objects' mode and redraw. There is your finished bevel gear!

BUILDING THE GEARBOX

Now that you have completed the guide to creating a gear system, you should sketch the gears for your buggy, as you will probably want to construct an automated model of your design using *Imagine*. Try and simplify your design as much as possible as this reduces rendering time. You will have to create axles for the cogs to run on, and you may even have to design a universal joint for the drive shaft to work with any suspension systems that you might add. You will also need a framework for your mechanism to work in.



The finished gearbox, mounted in the buggy that we designed in last month's article. Note that the buggy is cut away to show this

Finally you could present an animation of the gearbox working inside your buggy, showing the precise positioning of the drive rods and the framework.

The very last (and often the most important) step is to present the whole project to your technology teacher and get loads of As!

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from: DMS ☎ 0702 206165

Telling the Time costs £14.99

from: Rainbow
☎ 0392 77369

TELLING THE TIME – FOR 3-12 YEAR-OLDS

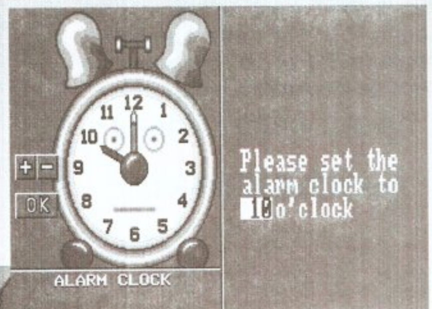
Whatever happened to those speaking wristwatches? In this program, Bobby the Clown is ready to teach us that telling the time is easy. Starting from reading the hours off an analogue clock to converting a twenty-four hour digital clock to analogue, *Telling the Time* places great emphasis on visual and audio feedback to develop a high level of interest for children.

The program works on a cumulative basis, making sure that the fundamental rules are laid down before any advance is made. However it must be said that, at times, this can become a little tedious.

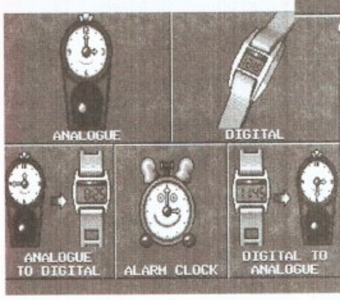
Telling the Time is separated into three different levels, the first only covering exact hours: "5 o'clock", for example. The second part covers fifteen-minute intervals such as "quarter past 3" or "half past 5". Level three deals with five minute intervals.

Unfortunately, single minute intervals and seconds are not covered by *Telling the Time*, so I can imagine this product being unsuitable for most 12 year-olds. Addition of times has also been ignored, so you won't find any questions along the lines of: "It is quarter past three. What time will it be in five minutes?".

One nice feature is the alarm clock, which is particularly likely to appeal to younger children. Here, Bobby the Clown tells you to set the alarm clock for a particular time. At 6 o'clock, for instance: ting-a-ling... it's tea-time and he eats his jelly pie!



Right: Using this facility it is possible to preset the alarm. At the set time, off it goes!



Left: Here is the menu screen. All of the options are selected via these well-presented and animated icons

Telling the Time is a well-presented and easily-used program. However, Rainbow are perhaps being a little patronising in suggesting that it is appropriate for 3 to 12 year-olds. It would have possible applications with children with learning difficulties, but really it is only suitable for use with children up to around 8 years of age. I also think the program should have tried more to address the pupil's understanding of time relativities, but this is budget software, and you get what you pay for!

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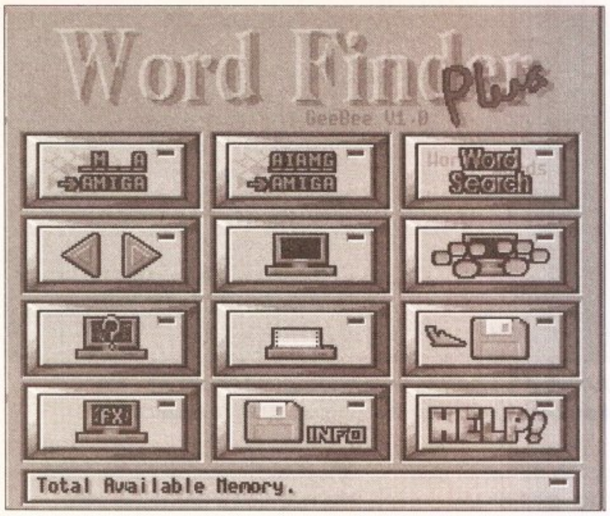
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SOFTWARE for FREE

Ian Wrigley samples the latest disks from the thriving public domain. This month the programs include a budget database, a selection of classical music, and a history of the Second World War



WordFinder-Plus has a great-looking interface, and a large dictionary containing most common words. However, it's a shame it's a bit slow

An interesting collection of disks has arrived this month, so without further ado let's get down to checking out the best in freely-distributable and licenseware software for the Amiga.

WORDFINDER-PLUS

Virus Free PD

WordFinder-Plus is a licenseware (£4.50) program written by Glenn Butler, and is designed to help you solve crosswords. It comes on two disks, the first containing the program itself plus documentation, the second containing the dictionary. As supplied, there are fortysomething thousand words in the dictionary; running from floppy, the dictionary can be expanded to around 100,000 words, and even more than that if the files are copied to a hard disk.

The program is exceptionally easy to use – the interface is attractive and clear. It takes the form of a panel of buttons, with tiny red indicator 'lamps' to show which have been selected. Three windows on the left of the screen show user input, words which have been found and any status reports: how far the search has progressed and so on. There is comprehensive help available, either via the help button or by pressing the Help key followed by one of the on-screen buttons.

The program will search for words with missing letters, will find anagrams and will find words within longer words or phrases (you know, "make as many words from the phrase 'Amiga Shopper is great' as you can"). Output can be to screen or printer, and a bar graph at the bottom of the display shows how much of each search has been performed. The program happily multitasks, with Amiga-A bringing the program back to the front again. Unfortunately, though, I couldn't make it multitask while it was actually performing a search – which is a pity, since this process can take some considerable time and it would be nice to be able to get on with something else while the program chugs away in the background.

In fact, my only real complaint with the program is the lack of speed. It just isn't fast enough. For instance, when trying to solve words with missing letters, entering the

> **"WordFinder-Plus... will no doubt be a great boon to any crossword enthusiast."**

RATING THE PROGRAMS

Just to be awkward, I rate the software that I review in two different ways, depending on what it is. Disk magazines, collections of clip art and the like are given a 'value for money' rating, since you're essentially paying for one thing, or group of things, on the disk.

Single programs which appear in a collection of others, or programs which I've downloaded from bulletin boards, are given a 'program rating', which reflects how good I think they are, taking into account usability, bug-proofness, my own particular (or should that be peculiar?) tastes and so on. Both ratings are out of a maximum possible 10.

BEGINNERS START HERE

What is PD?

PD is a general term which many people incorrectly use to refer to all freely-distributable software. In fact, PD (which stands for Public Domain) software is only one branch of this area; the other main one is shareware.

Essentially, PD software may be copied and used by anyone, although some authors place restrictions such as not allowing a PD library to charge more than a certain amount for the disk.

Shareware, on the other hand, should be treated more like commercial software. Although you are allowed to copy and pass around shareware programs, if you like one then you should pay the requested fee to the author – it's normally around £15 or less, and often entitles you to an upgraded version or a printed manual. Paying your shareware fees encourages software authors to write more programs – and if they don't, the Amiga scene will be a poorer place. Don't think that you're paying money for nothing, either – often hundreds or even thousands of hours of work have gone into creating a program, and it's only right that the programmer receives some reward for his or her work.

The third branch of software that we cover here is called licenseware. This is a form of shareware which is licensed to one (or more) PD libraries. In essence, when you buy a licenseware program you are buying shareware and paying the license fee at the same time. For this reason, you should treat any licenseware that you buy exactly as you would treat a piece of full-price commercial software – don't pass it around to your friends. You've only bought the right to use it yourself.

Can I pass other people copies?

Yes – that's the way that PD reaches a wider audience. Just make sure that you have followed the author's requirements for distribution. These are normally things like not charging more than a certain amount for the disk, or that you make sure that all the original documentation is included on the disk.

You can also pass on shareware – but not any registered copies of programs. If, when you pay your shareware fee, the author sends you an improved version of the program, then be careful not to give that out. Only pass on unregistered shareware.

You should not, of course, pass on licenseware – it should be treated in the same way as registered shareware.

letters 'HEL*' should produce held, hell, helm and help – and, indeed, that's what the program comes up with. However, rather than the fraction of a second that this should take (after all, there are only 26 possibilities to check) the process actually takes a good 30 seconds. On the other hand, *any* search for words with missing letters seems to take about this amount of time.

> **"The program is exceptionally easy to use – the interface is attractive and clear."**

All in all, *WordFinder-Plus* is a great little program, and will no doubt be a great boon to any crossword enthusiasts. The 40,000-plus word dictionary supplied is large enough to contain most common words, and you can add to it if you find any omissions. If it would multitask properly (that is, continue to search in the background), and if the searching algorithms were optimised so that they worked more efficiently and a little faster, then *WordFinder-Plus* would be pretty close to being worth the full 10/10. As it is, I'll give it...

Value for money...............8/10

WARBOOK

Asgard Software

WarBook was created by Eddy Morrison from Asgard Software, and is a freeware multimedia application charting the history of World War Two. Created using Gold Disk's *Hyperbook*, it covers the main events of the Second World War, including text files, maps and pictures.

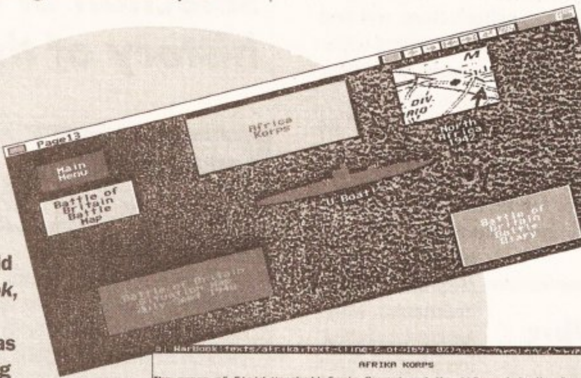
The text is presented in a simple text reader which anyone familiar with something like *More* or *MuchMore* will have no difficulty in using. Pictures and maps are displayed at (normally) full screen size, with a click of the mouse button returning you to the main screen.

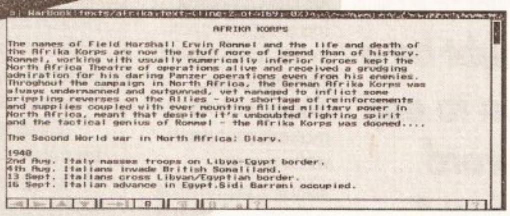
The text itself is well-written and informative. For instance, the Afrika Korps section contains a paragraph of introduction, followed by a chronological diary of the events in North Africa. Maps and pictures have, for the main part, been digitised from printed material, so sometimes the quality isn't perfect. They are perfectly adequate, though, given that if you're studying the war this isn't likely to be your sole reference. A few of the images have been created on computer and these, of course, benefit from being much clearer.

My main complaint is that the whole thing isn't linked together too well. Although there are pages of the Hyperbook which chronicle the war year by year, many of the pages are on specific subjects such as 'Assault on Japan', or 'Divided Europe'. I would have preferred to see the core of the book being the chronological pages, which in turn linked to other relevant sections. For instance, if the 1941 page mentioned U-boat attacks, then an icon could automatically take you to the U-boat page. Instead I found myself ferreting around to find the information.

That said, this is an interesting product and one which will, I'm sure, get better and better in future revisions. It can be obtained directly from Asgard Software, 20 Langdale Drive, Flanshaw, Wakefield WF2 9EW for £1.10 – this price includes postage and packing.

Program rating..................7/10





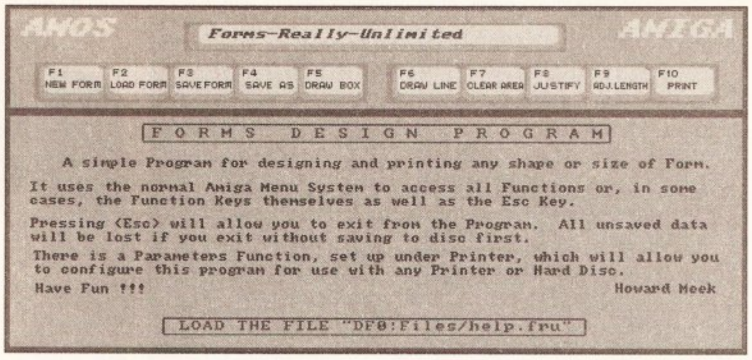
Above: The Second World War *WarBook*, from Asgard Software, was created using Gold Disk's *Hyperbook*
Right: Text entries in the *WarBook* are well written and informative (even if the grammar isn't perfect!)

FORMS REALLY UNLIMITED

PD Soft disk V782

It's a strange program, this. Howard Meek obviously saw the need for a program to allow users to easily create forms which could then be printed out as required. So why did he write *Forms Really Unlimited*? This really is a program which fails to live up to its creator's aims.

True, it allows you to draw boxes and lines, and to justify text – but only with some considerable hassle. For instance, the line tool will only draw horizontal and vertical lines. So why will it allow you to attempt to draw diagonal lines, and only complain when you release the mouse button? And why is there no way to undo a box or line if you've made a mistake? And how come the help file talks about "special corner characters" but gives no further clue as to what they are and how to generate them? And...



***Forms Really Unlimited* is intended to help design printed forms. The instruction screen looks good – but the program itself is rather dire**

You get the idea. The concept behind *Forms Really Unlimited* is a good one, but unfortunately the implementation leaves a great deal to be desired. Oh well, perhaps the next version will be different...

Program rating..................3/10

THE NUTCRACKER SUITE

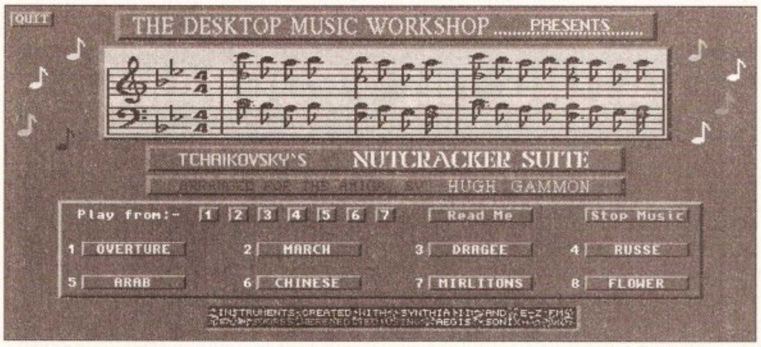
Desktop Music Workshop

A couple of times in the past I've mentioned programs from The Desktop Music Workshop: Rob Baxter's *Harpsichord Recital* is a case in point. Now Hugh Gammon, who does the coding for the DMW has released a disk of his own: Tchaikovsky's *Nutcracker Suite*. As with the other DMW disks, no sampled instruments are used – instead, all the sounds are created from scratch. And although I've had occasion to complain in the past that some of the sounds created in this way can sound just a little too electronic, this latest disk does generally tend to avoid those criticisms by using sounds appropriate to the pieces.

Hugh has written to tell me that he took note of my complaints about previous disks, and that you can now read the text file about the music at the same time as it is playing – and an interesting and entertaining file it is. It was created by Rob Baxter (these things really are a collaborative effort), and not only gives the story of the *Nutcracker*, but also some details of the individual pieces. This is useful since those of us not totally at home with classical music wouldn't know, for instance, that the correct name for *The Dance of the Sugar-Plum Fairy* is *Fee Dragee* – and that's how it's labelled on the intro page. Or, indeed, that *Everyone's a Fruit and Nut Case* is not the correct title – rather, it is *The Dance of the Mirlitons*.

The music can be played either as one continuous piece or by selecting which of the eight sections you want to hear. Each section takes ages to load – there's a lot of

continued on page 158



***The Nutcracker Suite* is another classical offering from The Desktop Music Workshop – this time Tchaikovsky is given the electronic treatment**

continued from page 156

musical data there – and made my disk drive grind horribly. I'm sure that it was fine, but after 15 or 20 seconds of whirring and clunking I really was beginning to worry! (Perhaps future versions should carry a prominent warning not to panic...) Apart from this, though – and a slight stutter a couple of times during *Fee Dragee*, when it sounded like my Amiga couldn't quite keep time properly – this is another 'must' for those who like to combine music and the Amiga, and who don't mind hearing their classical music played in a somewhat 'techno' style.

The Nutcracker Suite should be available from Amiganuts, Blitterchips and 17-Bit Software in the near future.

Value for money................8/10

FILE & HD UTILITIES 3

PD Soft disk V815

PD Soft seems to specialise in putting together collections of popular utilities, and *File and HD Utilities No 3* is no exception. Here's what you get on this extremely full (OK free) disk:

● **StarClick.** According to the documentation file, Kickstart 2 has the built-in ability to use the DOS standard '*' as a wildcard, rather that the Amiga's '#?'. It will also allow you to stop your floppy disk drives from clicking when there's no disk in them. However, there are no built-in commands available to do either of these things. StarClick allows you to turn on or off both features, either from the CLI or from Workbench (by specifying the appropriate tool types).

● **NoInfo.** If your favourite program insists on producing .info files whenever it saves a file, you can use this little program to disable the creation of those files. Just run it before you launch your program, and you'll be .info-free!

● **VMK.** Virus Memory Kill detects new viruses by checking for the types of actions that viruses are likely to perform – such as leaving sections of code which can survive resets. Although it doesn't actually check for any specific viruses, it is likely to be useful for those who already have a virus checker such as *VirusX*, but who want to make sure that the likelihood of any brand new virus infecting their system is minimised.

● **Degrader.** This program is for anyone who has found that, after you upgrade your system, your favourite programs have stopped working. It can force the Amiga to think that it's a PAL or NTSC machine, turn on or off the audio filter, activate the 'NoFastmem' utility, persuade the Amiga that it has 512K or 1Mb of Chip memory, and so on. If your programs are giving you grief when you try to run them on that new Amiga, this may well be worth a try.

● **DirWork.** I've looked at this program a couple of times before. It's a directory utility which works in a similar vein to SID, but is rather more configurable – and, to my mind, rather more confusing to use for the novice. Still, if you're a techie, and if you don't already have a favourite directory navigation tool (mine happens to be Workbench, actually, but there you go!), this might well be worth checking out.

● **DiskSpeed.** If you've ever felt the desperate desire to check the speed of your disk drive, this one's for you.

● **ReOrg.** This shareware disk optimiser defragments files and directories, which should improve the performance of your drives – both hard and floppy. The problem with such programs is that any power failure is likely to result in all your data being trashed – so make sure that you take a full backup before you risk running this program! Indeed, I think that any utilities disk which includes a defragmenter should also be forced to contain a backup program too.

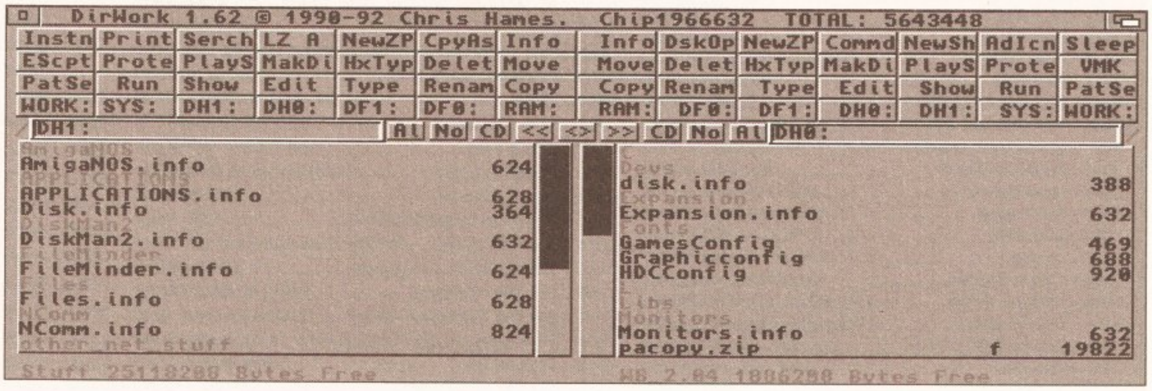
> **"It will also stop your floppy disc drives from clicking when there's no disk in them."**

● **HDFixer.** Apparently, "owners of an Amiga with a high density floppy disk drive are able to use 1.71Mb-sized HD disks under Kickstart v37.175." I don't own one of these, so I can't.

● **Sizer.** Finally, Sizer reports the size of all files on a disk in bytes and blocks. If you've always wanted to know such things, this program is just the job. It works from Workbench, and is simplicity itself to use.

Taken as a whole, this disk has a reasonable number of useful programs. Of course, on all such disks there are programs for which even the author has forgotten the real use, but this one manages to keep them to the minimum. Real power users probably already have any of these programs that they are likely to use; new Amiga users, on the other hand, should probably get hold of a copy.

Value for money................8/10



Just look at that range of menu options! *DirWork*, the old techie favourite, is present on PD Soft's *Disk and HD Utils No 3* – along with a range of other useful, and not so useful, programs for managing your discs and files

PHILO

Startronics

According to the letter that I received with this offering, *Philo* "was devised to assist anyone who has no knowledge of any kind of database," and will "enable anyone to go into the database, and be up and running straight away." Well, far be it from me to disagree, but... I disagree. Most vehemently, as it happens.

First off, it seems that unless you run the program from the self-booting disk, it won't work properly (at least, it didn't on my system). Then you discover that you must load a card file before you can use the program at all – there's no way to create one from scratch. So let's load, say, 'Private' and see what happens. Well, the layout appears, along with a toolbar at the bottom of the screen. So, naturally, I clicked the New button – wondering whether this would give me a new database or just a new record. A new record appeared (looking just like the one that was already on the screen), and I had to enter data – or at least press Return to cycle through all the fields. No choice here: once you've started entering data, you can damned well finish doing so – you're certainly not going to stop data entry halfway through a record, young man!

> **"You must load a card file before you can use the program at all."**

And so it goes on. The pitifully brief documentation which appears before running the program informs the hapless user that there are plenty of help files within the program, so absolutely no help is given elsewhere. Yep, the help files are there – you have to load them in as separate files, one at a time. God knows whether this will corrupt any data that you've got stored at the time – I didn't check. Frankly, G Drake has done him/herself and us no good whatsoever by releasing this effort on to the market. I value my data – and there's no way I'm going to store it in such a dodgy program as this. Oh, and there's no screengrab to illustrate any of my complaints, since the program (which is written in AMOS) wouldn't work when I booted from my hard disk, and booting from the floppy meant that there was no Workbench or CLI available to run a screengrabber from. To add insult to injury, when you quit the program you are left with a blank screen – you must reboot to do anything else.

If all of the above gives you the impression that I'm a little annoyed with this program – you're right. The author has the gall to have released it as licenseware; I wouldn't give it houseroom if he paid me to obtain the disk. The only reason it gets a 1/10 rating is because the buttons fade in and out in quite a cute way. Otherwise, we'd be talking zero.

Program rating..................1/10

CUT, TICK & POST.....CUT, TICK & POST

Telephone or Fax Hotline (0702) 466933

PD Soft (AS21) Bryant Ave, Southend-on-Sea, ESSEX, SS1 2YD

EDUCATION

❑X V13 PLAY & READ CHALLENGE (2) Education progs for the under 7's ❑X V546 KIDS PAINT A painting program designed for children. Includes various colours & speech. ❑X V584 FASTFACTS, Everything you ever needed to know about the solar system. WORLDMAP Produces different sorts of Maps. PLANETS Instant locations ❑X V737 EDUCATION This is a set of Animations gives a basic knowledge on Steam Engine's, Four Stroke Petrol Engine's & The Gasturbine Engine (3) ❑X V776 AMOS LESSON 1 The best Amos Tutorial program. (APD151) ❑X V792 KIDS GAMES Includes Geography, Math, Science and Word Games. Also contains Wheel of fortune. ❑X V793 AMIGA BEGINNER You asked for it! A tutorial for the beginner on using your Amiga! Covers CLI & Workbench, its great for learning about the Amiga ❑X V824 ELEMENT v3.0 A very nice interactive display of the Periodic Table of Elements. Education Product ❑X V825 WORLD DATA BANK v2.2 Using a database of coordinates compiled by the CIA this program plots world maps in cylindrical or spherical projects, with various degrees of magnification. ❑X V849 LANGUAGE TUTOR v1.0 Contains Instructions on Spanish, French, German and Italian. ❑X 2702 SNAKES & LADDERS The classic board game Now on the Amiga ❑X LP8 WORK & PLAY. CLICK CLOCK for Learning the time. LET GO SHOPPIN for simple Division / Multiplication. FUN TIMES TABLES Teach times tables. £4.99 ❑X LP10 WORD FACTORY a program to help kids learn to spell. £4.99 ❑X LP29 BIG TOP FUN Contains four programs to help children with words & pictures. £4.99 ❑X LP37 ROCKET MATHS Times Tables, Take away, Add up & Divide. £4.99 ❑X LP45 MUSIC BOX Excellent to introduce music, ages 7+ £4.99 ❑X LP59 PREHISTORIC FUN Who likes Dinosaurs four excellent parts £4.99

VIDEO PRODUCTION

❑X V48 TV & VIDEO GRAPHICS (8) Packed with background screens for your video productions, Different types of graphic styles. Peel, takes an IFF Pic & peels it down the screen. ❑X V86 VIDEO PRODUCTION 1-2 (2) Packed with video & Genlock utilities. ❑X V415 VIDEO SCREENS : 1 Back ground pictures for video production ❑X V517 VIDEO & AMIN : VIDEO DB, A program for keeping track on your video tape collections. RTAP, Lets you play large animations on small mem machines. ❑X V518 IMAGE LAB This program is like a mini Art DPT. Tools On Tap Does fades, colourbars & gray bar. ❑X V519 VIDEO: STILLSTORE Used to create over the shoulder graphic inserts like the 9'0 clock news. ❑X V636 VIDEO: SHADES & FADES ANIMFADER, A utility to fade screens in & out. SUPERVIEW Will display IFF pictures. TURBOTITLE Create subtitles. ❑X V677 ANDROIDS VIDEO BACK GROUNDS Selection of B/G Pictures. ❑X V687 VIDEO WIPES A collection of IFF Brushs & background graphic effects. ❑X V693 HARLEQUIN VIDEO ART & FONT DISKS A video production with excellent backgrounds & Fonts (3) ❑X V818 INSCRIPT v1.1 Produce video titles. Features include fully editable text entry, IFF Pics as back grounds, Unlimited number of fonts loaded, outline support (WB2.04), text styles & cycling, all resolutions. ❑X V829 VIDEO PRODUCTION 3-4 This is the latest collection of the New video related utilities. Excellent (2) ❑X L27 VIDEO: REAL 3D TEXTURES Contains various excellent Textures like Black marble, brick Work, Rough Ice, Marble, Tiles, Water ripples & Wood. £3.50 ❑X LP75 VIDEO LAB v1.0 Simple to use video titling package. Genlock is not required. Req Two Drives £4.99 ❑X FFP9 FLETCHER FONTS A three disk pack of 50 - 100 point 16 colour Video Fonts. Includes templates £9 ❑X FFP10 FLETCHER FONTS A three disk pack of 50 - 100 point 16 colour Video Fonts. Includes templates £9 *

VARIOUS UTILITIES

❑X V16 FISH TANK SIM A program that simulates an aquarium. ❑X V109 PRINT STUDIO Excellent for printing pictures or text. ❑X V191 MASTER VIRUS KILLER Virus Checker & killer. With Excellent options. ❑X V194 M.R.BACKUP HD Hard disk back up program with compression ❑ V215 DISKMASTER v3.2 Copies files from one disk to another. DISK SALV Corrects & repairs bad tracks. ❑X V262 DUPLICATION & BACKUP Super Duper, Turbo copy, Sanity copy & Pcopy. Four new disk copiers. ❑X V277 FORTRAN-77 v1.3c Compiler, linker & run time support libs. ❑X V279 CROSSWORD CREATOR Creates crosswords. UPDATED VERSION. ❑X V284 MCAD PROGRAM The Object Drawing Program. ie C.A.D. ❑X V298 NORTH C v1.3 (2) C language / Amiga. Includes all files required. ❑X V304 EYE OF THE BEHOLDER HINT BOOK Inc Introduction, Back ground, Maps, Strategy & Solution. ❑X V323 ANALTICALC SPREAD SHEET (2) The best spread sheet. ❑X V332 AMIGA PUNT PROGRAM Predict which horse will win the race ❑X V339 SPECTRUM EMULATOR Data Disk 1: The Adventure Classics ❑X V350 BUSINESS CARD MAKER Design your own Business cards. ❑X V366 600 BUSINESS LETTERS Over 600 Standard Business letters ❑X V386 DESK TOP PUBLISHING Includes various extra features like a Text Editor & Graphics editor & more ❑X V392 AMICASH BANKIN The best bankin program that I have ever used on the Amiga. Very easy controls.

❑X V394 CHEMESTETICS v2.06 Program that draws molecules using the calotte model. Excellent effects. ❑X V401 WINDOWBENCH v1.0 (2) An excellent Workbench 2 replacement / Upgrade for all WB v1.3 users. ❑X V413 WORKSTATION Not just another WB clone. It's a collection of utilities with the Workbench theme. (2) ❑X V417 SUPERBENCH & EXTRAS (2) An excellent replacement disk with more utilities than the original. ❑ V420 CURSOR BASIC COMPILER Compile any Amiga Basic program ❑X V423 CLI COMMANDS This disk is filled with utilities which can be used in your Startup-sequences. ❑X V424 ANTI-FLICKER Said to stop the flicker in High Res mode during some Amiga program operations. ❑X V431 IMPLODER v4.0 Reduces file size for storage on hard drives or your own disk collections. ❑X V433 ANIMATION STUDIO An excellent Animation creator for you to make your own little animations ❑X V444 PRINTER DRIVER DISK III New contains instructions on how to install them. includes over 90 ❑X V445 JRCOMM v1.02 This is the latest version of the modem program. ❑X V479 CHESS & CHESS UTILITIES A collection of chess related Puzzles ❑ V484 ADVENTURE SOLUTIONS (2) Solutions for various games. ❑X V489 AMIBASE PROFESSIONAL v2.0 Latest version of the excellent Database program. NEW FEATURES ❑X V490 MESSY SID v2.0 Will read MS-Dos disks, Transfer any text files to & from the PC. So you can do work on an IBM or an Amiga & swap text. ❑X V493 DESKBENCH (3) This is an excellent Workbench replacement ❑X V499 STAR CHART v1.2 This is an excellent star plotting program with some interesting features. ❑X V515 A64 PACKAGE v2.0 DEMO (2) PD version of the 64 Emulator Actually runs faster that a 64. only runs 64 basic. ❑X V516 THE COMPLETE A64 PACKAGE v2.0 With Interface & Full Commerical software. Transfers disks from your original 64 disk drive. Now in stock for £44.99 This is a Full regrested version of the Shareware program. ❑X V523 PLOTTING & GRAPHICS PLOTXY, A powerful full featured plotting prog. PLANS A computer aided drafting prog. Requires ARP ❑X V522 ARP V1.3 : Conman v1.3c Makes many improvements to Dos. Includes full developers guide. ❑X V523 DICE C COMPILER (2) Matthew Dillons full featured powerful C compiler & environment system. ❑X V536 CATALOGUE UTILITIES A collection of utilities used to Catalog disk/ Video & Tape collections (2) ❑X V554 R.S.I. MUSIC MODULES (2) Another selection of music from RSI. ❑ V556 RED SECTOR HELP DISK Helps you use the RSI Demo Creator. ❑ V560 DUPLICATION & BACKUP II A collection of copiers like Amiga Copy, Coder copy, Pcopy, Rattlecopy. ❑X V567 PRINTER DRIVER GENERATOR A selection of utilities with various excellent Printer Driver Generators. ❑X V569 DUNGEON MASTER MAPPER Creates maps of dungeons, lands which can be used in AD&D. ❑X V571 WHOM II v2.02 (2) The Dr.Who database program. Gives all info on Dr.Who programs. ❑X V573 FILE & HD MANAGEMENT (2) : HDCLICK v2.0, A program selector to make Hard disk Menus. Starts with gadgets. FILE MINDER, Utility for maintaining files & Directories. DOSCONTROL Tool that combines the functionality of many separate tools. ❑X V575 HOME BUSINESS PACK Excellent selection of utilities based on spread Sheets, Data Management, Spread Sheets, Accounts & Printing. (6) ❑X V583 ICONEDITOR III v2.0, Can create Icons upto 640x200 pixels, icons, Edit & Create any Amiga icon. ❑X V587 GELIGNITE FONTS (2) A selection of fonts for use with any DTP Package or Dpaint disks. ❑X V604 PD COPY v3.0 A New disk copy with some extra commands & quick copy modes built in. (1Mb) ❑X V605 PRC CALC v1.0 Offers the C or Machine code programmer a 68000 or FFP calculator when in use. (1Mb) ❑ V606 SAMPLE MAKER v1.0 This works specially for those who are not able to make samples with a sampler. ❑X V607 PRO TRACKER v2.2 Written by Lars Zap Hamre. Another update to the Ultimate sound making program. ❑X V610 GOLF SCORES v1.64 It will record each round you play. Store it, make up an eclectic score NEW! ❑ V611 FOOTBALL LEAGUE EDITOR v1.0 Want to update your teams league position as the results come in. ❑X V620 ASPICE v3.2 Circuit Analysis A full featured program for electric circuit ❑X V621 EDWORD v2.2 is a fully featured & operational Word processor ❑X V624 MB COPIER v2.0 Will copy in AmigaDos, Index Nibble modes, search mode & special parameter copy. ❑X V625 NCOMM v2.0 Contains, LHArc v1.0, LHArc v1.02, Zoom v5.40, DMS v1.03, LHA v1.11, LHASFX v1.11. ❑X V627 DPAINT FONTS No's 1-3 (3) The latest selection Fonts for use with any IFF Painting / DTP Program. ❑ V635 IBeM EMULATOR v1.05 Is a CGA Colour IBM-PC Emulator written to run on any Amiga. Shareware version ❑X V639 RADBENCH PLUS v2.0 Not just an update a completly NEW ❑X V645 UEDIT v3.a Word Processor with learn modes, Online Help, A Teach Mode, copy & paste and more. ❑X V647 HACKS A selection of WB Hacks that have been reviewed in CU ❑ V648 TITANICS CRUNCHER v1.0 Cruncher with help & various protect modes includes speed changes.

❑X V649 WP & SPELL CHECKING A Collection of utilities to help with your word processing needs. Spellcheckers ❑X V650 CHECKBOOK ACCOUNT Will manage your bank account with easy. ❑X V659 COMPUTER DIAGNOSTICS v9.1 Is there a problem with your computer! Then use v9.1 to check. ❑X V660 HOME MANAGER This is a great all in one address book with an inventory database & To-do list ❑X V661 MODELLING : VERTEX Allows you to create 3d objects without using the X, Y & Z views. Loads Sculpt 3d/4d & Turbo Silver. ❑ V662 DCOPY v3.0 PRO You can select the speed of the disk drive, Copy modes, Dos, Nibcopy, Ver & safecopy. Loads of other options. ❑X V666 MODELLING OBJECTS Contains over 20 vector objects in image format. Perfect with Disk V661 ❑X V667 STAR TREK OBJECTS Contains the U.S.S Reliant, NCC1701D. Image format. Perfect with Disk V661 ❑X V670 ANDROIDS FONTS 1-7 Self installing font disks for use with DPaint programs (2 Drives Rec. 7 Disks) ❑X V678 DRAW MAP v4.0 (2) Will now generate any 16 colour palette with user control, New features include larger maps with national boundaries, improved help & printing. 2Mb Other versions (1Mb ❑X V263)(1.2Mb ❑X V526 (2)). ❑ V680 DISK OPTIMIZER v1.0 Re-Creates Disks for faster loading. ❑X V681 GAME TAMER v2.2 Get a hold of that extra hard game & Cheat with Game Tamer v2.2. ❑X V682 DEKSID v2.05 Hexa & Ascii Editor for use with your Amiga. Full Program but still Shareware $15 ❑ V683 SUPER LOCK v1.01 Seal your disks / Hard drives for your eye's only. Protects with a Password. ❑X V684 FONT FARM A collection of utilities based around the subject fonts. Character Editor v1.0, Font master v1.0, Showfont v3.3, Set Font ❑X V685 ASTRO PRO ASTROLOGY The best Astrology program on the Amiga by far. See Amiga Shopper ❑X V686 MULTIDOS v1.12 This is another must for people with PC disks After this program has been installed your Amiga drives can read IBM Disks. ❑X V688 MAGNETIC PAGES v1.30 This Shareware program will create disk based magazines with graphics. ❑◎V690 WB v2.04 UTILITES (2) This set contains the programs that should have been with WB 2.04+. They take full advantage of the many NEW capabilities that are available. ❑X V692 RACE RATER v1.6 An excellent program for people who want information about horse races. ❑X V696 POST v1.7 An excellent PostScript inter-preter for the Amiga which implements the Adobe language. Requires v39+ & ConMan v1.3 ❑X V698 AGRAPH v2.0 Brings the world a cheap draw Bar, Line, Area & Pie chart production / presentation program. ❑X V700 PERM CHECK (PLUS) Is designed to take the chore out of checking plans for winning lines. ❑X V701 STRATA v1.0 Is a landscape generating program. It allows printing of them from any angle, from any position, & with any magnification. ❑X V702 EASY AMOS FOR EASY AMOS This is the first update for Easy Amos user's. Requires Easy Amos ❑X V703 AMOS UPDATER DISK v1.34 This update is a major update to the software. For example, you can now directly update a version of AMOS installed on a hard disc. ❑X V704 AMOS COMPILER v1.34 Second AMOS Compiler Update. ❑X V705 MED v3.21 Excellent update to the famous music program Med. ❑X V707 SCALEABLE CLIP ART This is completely new scaleable Clip pictures for Pro Draw (NOW 1 DISK) ❑X V710 AREXX TUTORIAL Includes several simple Arexx scripts & sample progs. ARexx comes free on all WB v2.04+ Workbench Disks. ❑X V711 UNIX Contains a working demo of Minix, A Unix workalike. Minix is system call compatible. ❑X V712 PROTEUS BBS An excellent program for modem & Hard Drive used to start thier own BBS ❑◎V713 COMUGRAPHIC FONTS Contains 2 clip art style fonts & 4 actual typefaces for use with WB 2.04+ & desktop publishing &/or video projects. ❑X V715 THE COMPLETE BIBLE With the entire text of the New Testament & Torah (Old Testament). 1Mb (3) ❑X V718 SPECTRUM EMULATOR v1.4 Which is NOW!! 3 times faster. Requires a Spectrum Rom image. ❑X V719 FREECOPY v1.8 Removes protected games copy protection so that the user can install them on HD. ❑X V720 DISKPRINT v3.51 A label database which printers & stoes disk labels. combined database & print utility for disks. Works fine with every printer. ❑ V723 BOOT INTRO CONSTRUCT ION SET Create excellent Boot intros. ❑X V724 PRINTER DRIVERS v4 This is an updated Drivers disk : Canon LP8, Canon Bubble jet's & Star 9 pin. ❑X V725 THE SUPER KILLERS v2.6: BOOT X v4.50 This is the best virus killer disk to date, kills over 262 virus & may be more. Includes many others ❑X V727 ART OF MED 2 A another excellent select of Med tunes. ❑X V730 ICON MANIA An excellent selection of Icon clip Art for your WB Disk. ❑X V731 AMOSBROT v1.1a This update has even more fractal types which include Logistic Equation, Coast lines & tree see As for reviews ❑X V732 WORKBENCH v2.04+ UTILITIES 3 DCopy, Boot menu writer, F-Fic, Sorcerer, Huge, QED. ❑X V733 SOFTWARE LISTER v1.6 This program is designed to keep a track of your Software collection.

❑X V735 MEMORY MANAGER v1.1 Select any amount of Chip / fast ram ❑X V740 POWERBENCH v1.2 The Workbench disks with more Power. This 2 disk set has been cruched & Opimized for maximum storage. (2) ❑X V742 ONLINE v1.4 Program will allow you to find cheats with games. ❑X V743 TERM v2.0 Best Communications program for use with WB v2.04+ (2) ❑X V745 THE PROFESSIONAL C MANUAL v3.0 This is the largest collection of documents, examples & utilities in C for the Amiga. It consists of six manuals, with more than 40 chapters, 175 fully excutable examples complete with source codes. Full instructions for C ❑ (12) Unchrunched & only ❑ (5) crunched Disks F691-F695 ❑X V757 AMIGADEX v1.61 Creates / converts your Amiga into a card Database system. Very well done. ❑X V758 TEXTPLUS v4.0e Another update of the excellent Word processor with AZSPELL Excellent spell checker ❑◎V760 BOOTX v5.03 An easy to use boot, file and link virus killer. Has lots of options to detect & kill Amiga viruses. ❑ V761 A-GENE v4.18 The latest version of the popular genealogical database program. By Mike Simpson ❑X V762 BBASE v5.5 Simple database will extra features like fast searches, mailing label support, and best of all it's easy to use. Max 9 Fields ❑X V763 GRAPHIC PRODUCTION Contains Scenery, LandScape, Land build v3.2, Cloud 9, Genesis demo. ❑X V765 MEGACOLOUR v1.0 A program which transforms a B/W screen into a full colour screen (320*256,64) ❑X V769 WORD POWER Is an excellent spell checker / Database ❑X V770 ACCOUNT MASTER v1.02 Excellent Amos written Account program ❑◎V773 WB v2.04 WINDOWBENCH v2.0 Excellent Workbench replacement for all WB v2.04+ Rom Users (2) ❑X V777 VOICE CLI The idea is to control the CLI/Shell with your voice ❑X V778 RAYSHADE v4.0 Complex Ray tracing package.2Mb (3) ❑X V782 FORMS Create, Edit, Draw, Colour & print your own forms ❑X V783 PROGRAMMING TOOLBOX Many programs to help in your development efforts (most C but some in basic). ❑X V784 AREXX (2) Two disks which contain Arexx programs & examples ❑X V786 PASCAL This disk contains everything needed to program in Pascal. Includes a68k 68000 assembler & more. ❑X V787 PROGRAMMER TOOLS GadToolS to design your user interface to your own programs using all of Amiga DOS 2.0+s new features. Also RegTools. ❑X V788 RELIGION Contains scripture_Mem aids for memorizing verses & passages Pauls Journey. ❑X V790 ANIMATION UTILS Includes CyrcUtils for splitting, combining, and creating animations from IFF picture files. ❑X V791 DIRECTORY ULTS Includes the most powerful and highly recommended programs which are designed to make CLI & Shell tasks virtually obsolete. ❑X V794 GRINDER A complete graphic conversion package that supports GIF, JPEG, Atari ST (Neochrome / Degas), PCX, Targa, TIFF, Ham-E and IFF format pics. ❑X V795 ABC ADVENTURE CREATOR You can create your very own adventures within Amos. Program by Chris Beeson. ❑X V796 ADDRESS & BOOKBASE Two database programs for recording your Address & Books. Specially designed ❑X V797 EASY AMOS PROGS (2) Contain source code for use with Easy Amos. ❑X V799 ADVANCED UTILS SerNet & ParNet, Connect 2 Amiga & share resources via the serial / Parallel ports. Mymenu Puts menus on your Workbench screen. ❑X V800 ARCHIVERS II This disk is packed with the latest Archivers to date. ❑◎V806 WB v2.04 UTILITES (2) This is the our second double disk collection of WB v2.04+ utilities that take advantage of the NEW machines capabilities. ❑X V809 MEGA CHEATS v2.1 This disk contains the very latest cheats. ❑ V811 ELECTROCAD v1.42 & PROTOYPER Another Updated on the cad / Electronics drawing Programs. ❑X V812 CANON This disk contains Printer Drivers & Canon Studio, Gives better print output for any 9 pin printer. ❑X V814 PC TASK v1.11 is a software IBM-PC Emulator. Allows you to run the majority of IBM software with NO additional hardware. CGA Colour NEW UPDATE ❑X V815 FILE & HD MANAGEMENT 2 : DirWork v1.62 File copier MegaD Another NEW Update on an excellent File copier like the NEW Disk Master Pro II in it's Operations. Also contains loads of other programs to help out (2) ❑X V817 A500 PLUS EMULATOR As it sounds will let v1.3 / v1.2 owners run WB v2.04+ software with out any need to purchase the WB v2.0+ chips. ❑◎V819 ICONAUTHOR v1.0 A replacement for IconEdit 2.0. It can transform IFF images or brushes into resized 2-BitPlane brushes or icon files that match the WB v2.04+ colours. Help available. And More ❑X V820 BBBBS v5.4 Baud Bandit bulletin Board System Frames include up to 99 file libraries, interface to extra devices ❑X V821 SNOOPDOS v1.5 Monitors AmigaDos calls & allows you to see what library, devices, fonts are required. ❑◎V822 HD BACKUP v3.5 A hard drive backup program that features, multi-drive support, full backup, compression. Requires Arp v39 for v1.3 users (V522) ❑X V823 POWERPLAYER v3.0 A very powerful, user friendly & system friendly module player. It can handle nearly all module formats, can read power packed modules & comes with it's own cruncher. ❑X V826 AHDM v3.00a Hard Drive Menu. When placed in your startup-sequence, offers a 16 page menu, each page having upto 10 possible actions.

❑X V827 REPAIR-IT: NewZap v3.3, A multi sector file editing system. FIXDISK v1.2, Recover's as much as possible from a defective disk DISKSALVE v1.42, Creates a new file system structure on another device, with as much data salvaged from the original device. ❑X V828 STARCAT v2.0 An excellent program to create lists of your software. ❑X V841 MODULA-2 Contains modula-2 language on the Amiga. ❑X V842 SID v2.5 FILE MANAGER Sid can be used for various operations. The best file copier on the Amiga. ❑X V843 DESERT STORM You can select Map's, and all information surrounding the Desert Storm Attack. ❑X V844 DELITRACKER v1.3 Powerfull & system friendly music player. Will play over 40 difference types of modules. ❑X V845 Q.M.J v3.31 Will generate julia sets & complex Quaternion Julia slices. Displays mandelbrots. ❑X V846 SOPORIUS MAPPER An excellent Dungeon mapping program ❑X V847 MONEY MANAGEMENT v1.01 The home account package which allows you to keep track of upto 12 accounts simultaneously ❑X V848 SLIDESHOW GENERATOR v3.1 Creates slideshows of pictures in various formats for the amiga. ❑X V850 FRAC v1.1 is a graphical Role playing game creator.

ERIC SCHWARTS

❑X 981 STEALTHY MANEUVRE II * ❑X 1085 F-16 SWISS FLYING * ❑X 1609 NAVY AEROSOR, SOVIET SOFT LANDING, STEALTH BOMBER * ❑X 1700 ANTI- LEMMINS (2) 2Mb ❑X 1703 DATING GAME (2) 3Mb ❑X 1842 SHUTTLE COCK * ❑X 1850 LATE NIGHT / TERMINAL* ❑X 2021 VIETNAM CONFLICT * ❑X 2133 GULF WAR CONFLICT 2Mb ❑X 2307 AMY AT THE MOVIES II (4) ❑X 2311 AMY vs WALKER II (2) 3Mb ❑X 2384 AMY AT THE BEACH (2) 3Mb ❑X 2427 CAMOUFLAGE * ❑X 2475 BATMAN & VEIL CONTEST * ❑X 2476 HOW TO RUN ❑X 2477 AMYWALKS ❑X 2478 UNSPORTING 2Mb ❑X 2499 ERIC SCHWARTZ TOR * ❑X 2500 THE SKY DRIVE *

GAMES

❑X 947 CARLOS MONTE'S CASINO Play Blackjack & Solitaire within this excellent & professional looking game. ❑ 1073 TETRIS ORIGINAL This is the closest game to the original tetris ❑X 1420 DTRIS If you want a1 or 2 player Tetris this has to be 1 of them. ❑X 1561 TRITWIS Contains 1 player, 2 player & 3 Payer game options. ❑X 1735 ASTERIODS 'THE ORIGINAL' Another old classic. Original classic ❑ 1747 LLAMATRON GAME 2001 By Jeff Minter & an excellent production. ❑X 1749 SCRAMBLE 'The Original' Remember that old classic game well! here it is now on the Amiga. ❑X 1870 PATIENCE'S This is the best version to date. DOMINOS, Play vs the computer or another player. ❑X 1977 POM POM GUNNER Shoot down the incoming world war II air planes in this Operation Wolf game ❑ 2018 JETMAN Another Spectrum classic converted to the amiga. It's JetPak with all the original sounds. ❑X 2022 SEA LANCE The first Silent Service type sub war game on PD ❑X 2054 ATIC ATAC A rendition of the game from the original Spectrum ❑X 2162 BATTLE OF BRITIAN WAR GAME 2 Strategy war games which both need loading through WB. ❑X 2164 DUNGEON ON NADROJ This is the best Dungeons & Dragons Public domain type game. Load WB ❑X 2178 SURVIVOR Colourful graphical adveture within the Aliens theme. ❑X 2199 PARACHUTE JOUST You are falling down to earth, & must take the Parachute from the other player. ❑X 2220 STRATEGIC GAMES Eternal Rome, Lords of Hosts, In Moonshine. An Excellent collection of games. ❑X 2221 MIND GAMES 21 of the best Mind games to challenge your mind not your shooting skills. ❑ 2224 SWORD OF THE WARLOCK A Bards tales / Eye of the Beholder adventure game packed on three disks. This is Shareware (3) 1Mb (2 Drives)

❑X 2272 BLACK JACK LAB Play all the popular versions of Pontoon ❑X 2278 CARD SHARP A very professionally presented selection of solitaire type card games. Excellent. ❑X 2279 SUB ATTACK v1.0 Control the torpedoes & sink the enemy ships as they sail past. LANDMINE. ❑X 2280 DIPLOMACY Classic strategy game loosely based on World War 1. 2Mb for computer player ❑X 2313 REVENGE OF THE MUTANT CAMELS By Jeff Minter The ride of a life time with mutant camels ❑X 2396 PETERS QUEST This is truly an excellent platform game. ❑X 2411 TOTAL WAR The board game RISK as reviewed in AF. ❑X 2432 GOLDEN OLDIES Galaga, Galaxians, Space invaders, Asteriods, Batty & Missle Command. ❑X 2436 DRAGON TILES v2.5 Mahjong is a ancient chese game where you must remove coloured tiles. ❑X 2447 COINDROP A Fruit Machine simulator with various gamble modes. ❑X 2448 CRAZY SUE Another first rate cute school girl platform game. ❑X 2455 ENSIGNIA MAYHEM You pilot a ship around throught a series of narrow caverns. Search for esc convicts. ❑ 2450 SMASH TV - THE RIP OFF Simular to the original arcade machine. With neat graphics & sound. ❑X 2480 AMOS FRUIT MACHINE II As near as possible to the fruit machine found in Pubs & Arcades. ❑X 2482 DESCENDER Is a clone of the classic arcade game Tempest complete with vectorized graphics. ❑X 2483 INTRUDER Is a Multi level Berserk clone which features smooth gameplay, great graphics & sound. ❑X 2484 CATACOMB v1.7 A graphical adventure game set on a small island in the middle of the land of EXOUSIA. NEW ❑X 2485 IRON CLADS (1Mb) Update to the excellent Strategic War Game (2) ❑X 2489 COLOSSAL CAVE v1.0 Is virtually identical to the original classic. ❑X 2490 RUMMY Graphical card Game ❑X 2491 LEGEND OF LOTHIAN v1.02 is an adventure game in the vein of the Ultima game series. ❑X 2494 HUNCHBACK This is a conversion of the old classic game. ❑X 2498 AMOS CRICKET Excellent arcade cricket simulator with graphics. ❑X 2511 DOODY A cross between Bouble Bobble & Manic miner. ❑X 2534 BATTLE CARS II Get behind the wheel of a heavily armed car as you race round courses.2 players with the computer link ❑X 2535 SUPER PACK MAN 92 This is the best Pack man to date with super smooth scrolling & excellent graphics. ❑X 2613 DUAL A 2 player game where you control armoured tanks & rockets. ❑X 2614 TETREN is a 1 or 2 player Tetris game written in Amos. 2 player game is Head to Head ❑X 2615 WAR Is a space strategy war game. in which you control a fleet of space craft. Space War game ❑X 2617 Golden Oldies 2 : Croak, Excellent 1 or 2 player version of Frogger. MouthMan, version of packMan. Bi-Planes, This is the most additive games we have played here 2 player only. Trail-Blazer, C-64 classic. Scamble. ❑X 2620 DR MARIO A Strange Tetris like game where you move coloured pills down the screen. 3 in a row go's ❑X 2621 ETERNAL ROME Start the roman Empire from 328C. Build fleets, armies & send them into battle. ❑X 2622 CLASSIC GAMES 3: Donkey Kong An excellent platform game in which you must rescue the girl. Frantic Freddie & Mad Bomber ❑X 2674 INTERPID In the Artic ice you control a tank on a mission to rescue hostages in this superb Amiga original ❑X 2675 ADDAMS FAMILY QUIZ Digitized graphics & sounds a crowd pleaser. ❑X 2676 AMI MORIA v5.4 Loads of new features like better graphics, larger dun-geons, On screen updates, overview of the dungeon's map & Loads more. ❑X 2707 KLAKLRIS Yes its another excellent TETRIS variant. NEW VERSION ❑X 2708 SUPER COMBAT v2.0 This is a 2 player Gauntlet Type combat game ❑X 2710 CLASH OF THE EMPIRES v2.1 Strategical War Game By T.A.Sear from Sheabury's war Gaming Club. This is the second & final version (2) ❑X 2712 ACT OF WAR Simular in style to the classic game Laser Squad. You control a team of special troops. ❑X 2715 TANK ATTACK This is a 1-4 player version of the Classic Cartridge game Combat. 4 Joysticks can be used. ❑X 2716 RESCUE An adictive space style game simular to Scramble. Excellent graphics & sound.

❑ 2721 E-TYPE II Asteriods space adventure where you jet around collecting new weapons. ❑X 2723 SOLITAIRE (Klondike) The most popular card game on the amiga. An excellent version. ❑X 2724 NEIGHBOURS ADVENTURE (2) This is the best graphical adventure on the amiga at the present time. With full digitized colour pictures where you can select object from the pictures & put them in your contains control panel. Excellent ❑X 2732 CYBERNETIX Defender / Stargate style super fast scrolling shoot em up game. Excellent ❑X 2738 AIR TRAFFIC CONTROL You have to try & guide upto 100 planes in this AirPort Simulator. ❑X 2775 ROULETE ROYAL The complete game

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5	X 2677	KAROKE (GOSPEL) / COMPLEX
6	X 2633	XPOSE / THE SILENTS (2)
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8	X 2524	MELON / HUMAN TARGET
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10	2632	TECHNO CONSPIRACY/MAJIC12 * (2)
11	X 2250	ODYSSEY BY ALCATRAZ* (5) 1Mb
12	X 2628	GET FROGGED / DECAY *
13	2763	ITS TIME TO PLAY (NEW)
14	2679	ENTERTAINMENT / XPRESS PLC (NEW)
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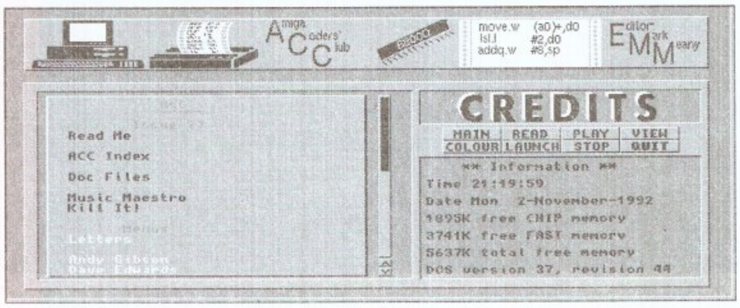
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DISK MAGAZINES

Whether you're interested in assembly language or Star Trek, there's a disk magazine for you. Ian Wrigley scrolls through six of the best electronic periodicals



The Amiga Coders' Club **newsletter is a neat piece of coding in itself – but then, you'd expect that from a disk magazine dedicated to programming!**

It's been a while since I last took a look at what disk magazines are available, so here goes. The quality of what's on offer varies from the excellent to the truly dreadful (some complete turkeys didn't make it to these pages – the authors would be too embarrassed). By and large, you need to expect some rather 'creative' grammar and spelling on many disk mags, but on the other hand you often get a good selection of utilities, games and editorial comment (I've even seen *Amiga Shopper* mentioned a couple of times in the past few months, so at least the editors have some taste when it comes to reading material).

Right, on with the show...

AMIGA CODERS' CLUB

This disk mag is available on subscription from Amiganuts, and is edited by Mark Meany. As the title suggests, this is a title dedicated to those who want to program the Amiga. Furthermore, it's for those who want to program the beast in assembly language, rather than a higher-level language like Pascal, C or even AMOS.

Let me say straight away that the last time I touched a piece of assembly code was several years ago, so I'm a little out of touch with the latest developments on the Amiga. However, the contents really do seem to be written by people who know what they're talking about. There are letters and tutorials – the one on Disk 27 which I looked at is entitled "Collision Checking Using the Blitter", and was written by Mark himself – as well as source code and occasional example programs.

The whole thing is controlled from a neat and easy-to-use menu (although, horror of horrors, the menuing program was apparently written in C), and provides a constant listing of the date, time and memory free on the Amiga.

If you're a 'propeller-head' of any description, you could do far worse for yourself than checking out the *Amiga Coders' Club*.

Value for money.................8/10

DIGITAL ACCESS

Digital Access is an old favourite to these pages, although the main menu seems to have undergone a bit of a change since I last looked at it. In fact, the whole thing has undergone a minor overhall – Steven, the editor, has obviously got himself a digitiser, for a start, and all articles are now accompanied by a digitised picture of the author (which means that we get to see quite a few pics of Steven, since he has written quite a few of the pieces himself). There are also plenty of pictures to illustrate articles – a piece on the old Texas Instruments TI99/4 computer, for instance, shows you the computer itself, games carts, chips, and more. Articles are presented in the form of scrolling text – move the mouse forwards and backwards to control the speed of the text, click the left mouse button to pause it. But there's no way to scroll back up the text, other than re-displaying it.

"All articles are now accompanied by a digitised picture of the author..."

There's plenty to read on the first of the two disks: an electronics section includes details on how to build your own sound sampler and vehicle immobiliser, there are jokes, reviews of Amiga magazines (*Amiga Shopper* gets a very respectable 8/10), a discussion of whether the new Channel 5 TV station will cause problems for your Amiga and loads of other stuff. The second disk contains a range of programs including *NoClick*, which stops your disk drive clicking all the time, a touch-typing tutor, the anti-virus program *Nuke* and various others.

All in all, *Digital Access* really has gone from strength to strength over its ten-issue life. The magazine costs £2.95 for each two-disk issue, comes out once every three months, and is available from Steven Lord at 6 Stubbing Brink, Hebden Bridge, West Yorkshire HX7 6LR. It's well worth checking out.

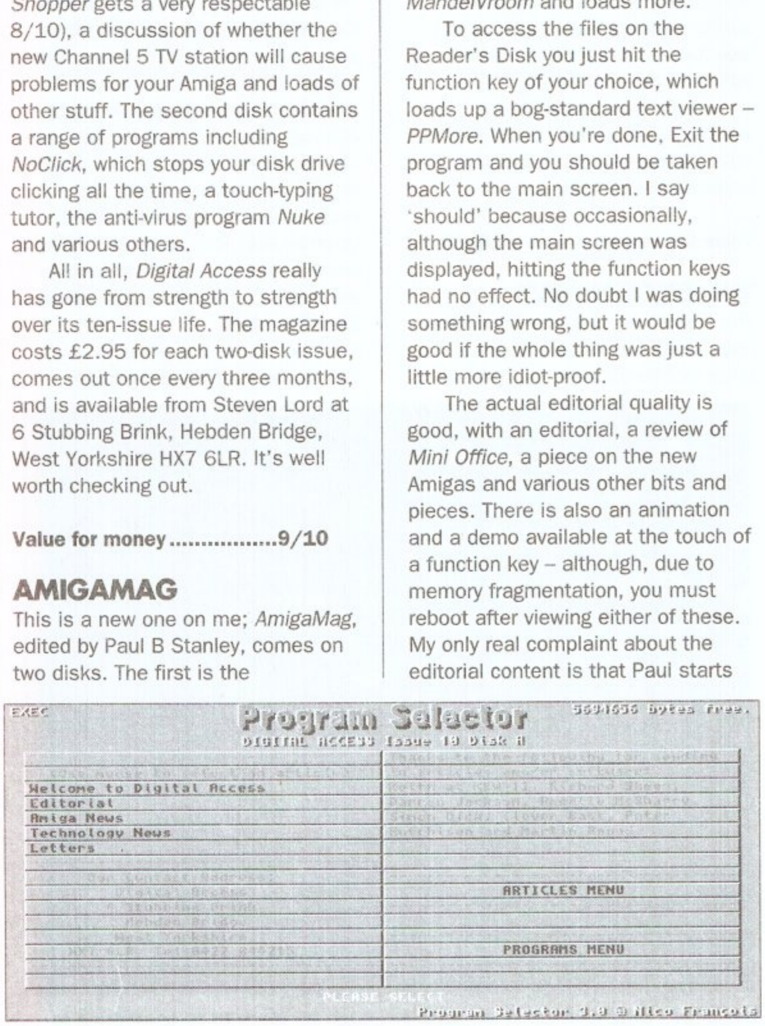
Value for money.................9/10

AMIGAMAG

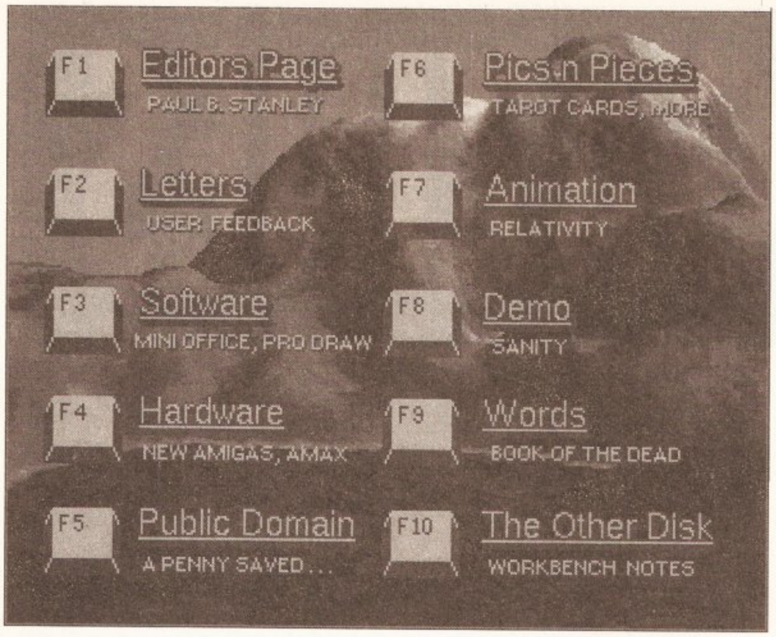
This is a new one on me; *AmigaMag*, edited by Paul B Stanley, comes on two disks. The first is the conventional 'editorial' disk, called the Reader's Disk, while the second – the User's Disk – boots up with Workbench and contains a selection of programs such as *NoClick* (again), *The Directory Manager*, *MandelVroom* and loads more.

To access the files on the Reader's Disk you just hit the function key of your choice, which loads up a bog-standard text viewer – *PPMore*. When you're done, Exit the program and you should be taken back to the main screen. I say 'should' because occasionally, although the main screen was displayed, hitting the function keys had no effect. No doubt I was doing something wrong, but it would be good if the whole thing was just a little more idiot-proof.

The actual editorial quality is good, with an editorial, a review of *Mini Office*, a piece on the new Amigas and various other bits and pieces. There is also an animation and a demo available at the touch of a function key – although, due to memory fragmentation, you must reboot after viewing either of these. My only real complaint about the editorial content is that Paul starts



Digital Access **has undergone a number of changes over its past 10 issues, including digitised illustrations and a slightly different front end**



***AmigaMag* is a two-disk offering consisting of a floppy full of info and reviews (the main menu is shown above), and a second disk containing programs**

his review of *Mini Office* by telling us that he was a beta tester, and so is "quite comfortable" reviewing the product. Er... actually, a beta tester possibly isn't the best person to review a product, since they are a little less likely to be totally impartial. Still, letting that pass, the overall quality of *AmigaMag* is good, and I look forward to seeing the next edition in the near future.

AmigaMag is available by sending £3.00 to Paul B Stanley at 102 Kesteven Road, Stamford, Lincolnshire PE9 1SS.

Value for money................8/10

THE ZIRCON MAG

The Zircon Mag is a brand new disk mag, which has apparently taken three months to write and compile. It seems that the authors have been producing utility compilations, demos and the like for some time, and decided that they wanted to start producing a disk mag as well.

The menu system is written in AMOS, and is quite elegant. Move the cursor to the title of the article – the highlight moves with the cursor – and click to get the first page. Then using the up- and down-arrows actually scrolls through the pages, although this isn't documented very clearly. In fact, there are two pages to the main menu – again, the second page is accessed with the up-arrow key. This really isn't clear enough, though – I almost reviewed the mag without realising about all the other stuff.

The articles are written in a demo-crew manner (then again, that's partly what the collection of people known as Zircon seem to be, with 'cool' names like Gears, Shot, Hawk and so on) and are fairly jokey and *ad hoc*. There is certainly talent there, though, and the contents are varied enough to ensure that there's likely to be something of interest to most people. The disk includes a few utilities which can be accessed via the Workbench and, unlike most disk mags, the whole thing can be run from an already-booted Amiga.

"The Zircon Mag... has apparently taken three months to write..."

The first edition of *The Zircon Mag* is public domain, to encourage readers, but the next edition will cost £2. You can get more information, or submit articles, to the editor, Gears, at 49 Love Lane, Great Wyrley, Walsall, West Midlands WS6 6NW. If you want a copy of the first edition, don't forget to send a blank disk and a stamped, self-addressed envelope.

Value for money................6/10

AMIGAHOLICS

Issue 9 of the *Amigaholics* disk mag opens with a neat little intro (cancellable with the right mouse button, for those who've been waiting hours for something else to happen), and then presents a standard-looking menu, brought to you courtesy of Nico Francois' ubiquitous *Program Selector*.

Amigaholics is a club, rather than just a disk mag, and the contents of the disk reflect this. There is less actual editorial on the disk than on some other mags, although the disk also contains some programming tutorials, music, a picture gallery and a drawer full of 'goodies' – including something called 'ping', which makes the cursor behave very strangely indeed until you reboot the Amiga. There's also an anti-virus program which kicks in when you boot with the disk, although it doesn't behave very well with some makes of hard drive, including the RocHard drive which I own.

A major part of the disk is the Amigaholics PD library. This contains a wide range of software in a number of categories, all of it available for free – just send a blank disk and return postage. The fact that Amigaholics is a club is clear from the documentation, which says, "If I am unable to supply the software from my own collection, I will forward your order on to the member nearest to you who does have it."

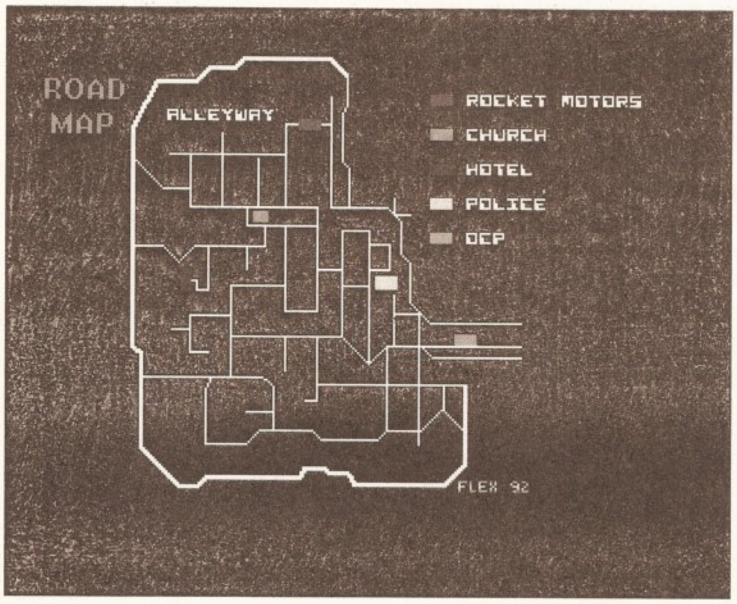
Other features are the standard editorial, a section for pen-pals, letters pages, and a piece on DTP.

The author, Kevin Bryan, doesn't give any details on membership of Amigaholics. However, I'm sure that if you're interested, and you send him a blank disk and an SAE, he'll send you a sample copy of the disk mag and any club details. His address is Amigaholics, 29 Wolfe Crescent, Charlton, London SE7 8TS.

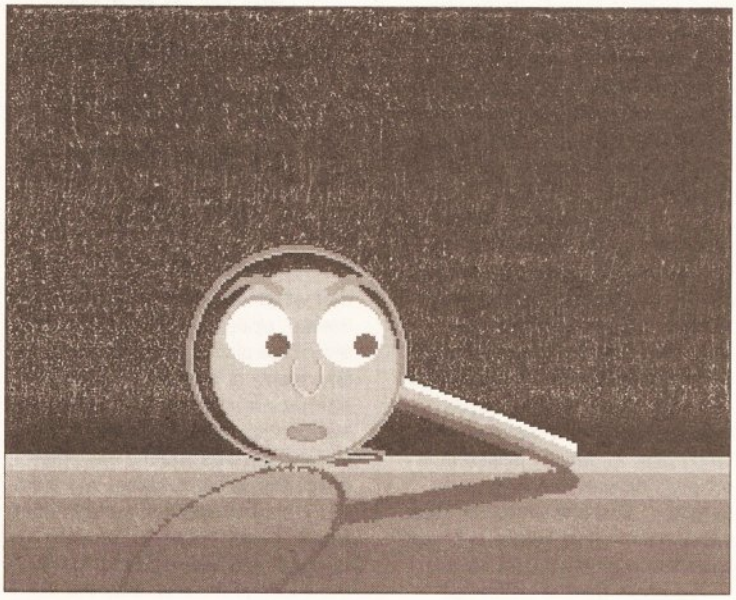
Value for money................7/10

THE FINAL FRONTIER

The Final Frontier is a mammoth four-disk magazine, dedicated to fans of *Star Trek* – the TV series, *The Next Generation* and the films. Each disk is auto-booting and has a basic



***The Zircon Mag's* contents are varied enough for there to be something to interest most people, with numerous cheats, hints, and maps for games**



Among the assorted 'goodies' on the *Amigaholics* disk are some cute animations, including this one of a worm crawling behind a magnifying glass

menu system – according to the editorial, the team has had problems with programmers which means that at present they are using a simple front-end. Still, as editor Simon Plumbe points out, it's the quality of the articles that counts.

Given that I'm probably the only computer fan who isn't a *Star Trek* fanatic, I approached *The Final Frontier* with some trepidation. There are few things worse than a gathering of enthusiasts in a subject that you're not interested in, but I must say that this disk mag is well put together, and has a wide range of articles and graphics.

Because each disk is auto-booting, there's no problem with constant swapping in and out of disks. However, it does mean that every time you want to use another disk you must spend a minute or two waiting for your Amiga to reboot. Oh, and the intro on the first disk won't run on some machines, including those running Kickstart 2.04 or those with 1Mb of chip RAM – which effectively precludes huge sections of the Amiga community. Come on, guys, sort this out – please!

The contents are generally very well written, and include book and merchandise reviews – with pictures of some of the offerings, such as a commemorative mug – stories, reviews of films, episode guides, graphics from Trekkie demos and even some music.

No, I'm not a *Star Trek* fan. But if you are then you really do need to get hold of *The Final Frontier*. Issue 3, which I reviewed, rivals many fanzines that I've seen – I wouldn't be surprised if it started appearing on Forbidden Planet's shelves in the near future! (Stardate 123.456.7, to be exact...)

The Final Frontier is available from a few PD houses, or directly from the editor, Simon Plumbe, at 14 Rousdon Grove, Great Barr, Birmingham B43 5HN. It costs £5 for the four disks.

Value for money...............10/10

WHERE TO GET IT

There are two main ways to get hold of Amiga PD and shareware: from a bulletin board or from a PD library.

The advantage of using a bulletin board is that often the latest software is uploaded as soon as it's available. On the down side, you need a modem to connect, and you'll have to pay phone charges (and sometimes a connection fee to the bulletin board as well).

There are a growing number of bulletin boards with a wide range of Amiga software available for download. Check out 01-for Amiga (071 377 1358) and the Cheam Amiga Bulletin Board (081 644 8714). Another good option is joining CIX (the Compulink Information eXchange), which not only has Amiga software but also contains conference and file areas on a wide range of subjects, from politics to scuba diving, biking to Science Fiction. Many of the *Amiga Shopper* writers have accounts on CIX, so you can get first-hand advice on your problems, too. For more details, call CIX on 081 390 8446 (voice) or 081 390 1255 (modem).

If you don't want to use a bulletin board, the other way to get PD software is from a PD house. Many advertise in *Amiga Shopper*, and you'll find a comprehensive list of names and addresses at the end of this article. Expect to pay between 99p and about £2.50 per disk – there's often a discount if you buy in bulk, too. As for the difference between the companies which charge 99p and those which charge £2.50 – well, try both types. There are brilliant, totally professional PD houses which charge less than a quid, and there are totally incompetent (dis)organisations which charge more than twice that.

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Keighley
BD21 4NN
☎ 0535 667469

Crazy Joe's
145 Effingham Street
Rotherham
South Yorks
S65 1BL
☎ 0709 829286

Deltrax PD
36 Bodelwyddan Ave
Old Colwyn
Clwyd LL29 9NP
☎ 0492 515981

Deja Vu
7 Hollinbrook
Beech Hill
Wigan WN6 7SG
☎ 0942 495261

Essex Computer Systems
118 Middle Crockerford
Basildon
Essex
SS16 4JA
☎ 0268 553963

George Thompson Services
Cucumber Hall Farm
Cucumber Lane
Essendon
Herts
AL9 6JB
☎ 0707 664 654

ICPUG
PO BOX 1309
London
N3 2UT
☎ 081-346 0050

NBS
1 Chain Lane
Newport
Isle Of Wight PO30 5QA
☎ 0983 529594

PD Soft
1 Bryant Ave
Southend-on-Sea
Essex
SS1 2YD
☎ 0702 466933

Pentire PD
10a Hag Hill Lane
Taplow
Maidenhead
Berks SL6 0JH
☎ 0628 666641

Riverdene PDL
30a School Road
Tilehurst
Reading
Berkshire RG3 5AN
☎ 0734 452416

Telescan Computer Services
Handsworth Road
Blackpool FY5 1SB
☎ 0253 22296

Sector 16
160 Hollow Way
Cowley
Oxford
☎ 0865 774472

Seventeen Bit Software
PO BOX 97
Wakefield
West Yorks
WF1 1XX
☎ 0924 366982

Software Expressions
Unit 4
44 Beauley Road
Southville
Bristol BS3 1PY
☎ 0272 637634

Softville
Unit 5, Stratfield Park
Elettra Avenue
Waterlooville
Hants PO7 7XN
☎ 0705 266509

Startronics
4 Arnold Drive
Droylsden
Manchester M35 6RE
☎ 061 370 9115

Vally PD
PO BOX 15
Peterlee
Co Durham SR8 1NZ
☎ 091-587 1195

Virus Free PD
31 Farringdon Road
Swindon
Wiltshire SN1 5AR
☎ 0793 512321

BUYING ADVICE FOR SHOPPERS

Whether buying over the phone or at a local store, here's our advice on how to get what you want

BUYING IN PERSON

- Where possible, always test any software and hardware in the shop before taking it home, to make sure that it works properly.
- Make sure you have all the necessary leads, manuals or other accessories you need.
- Don't forget to keep your receipt.

BUYING BY PHONE

- Be as clear as possible when stating what you want to buy. Make sure you confirm all the technical details of what you are buying. Some things to bear in mind are version numbers, memory requirements, other required hardware or software and compatibility with your particular model of Amiga (that is, make sure you know which version of Kickstart you have).
- Check the price you are asked to pay, and make sure that it's the same as the price advertised.
- Check that what you are ordering is actually in stock.
- Check when and how the article will be delivered, and that any extra charges are as stated on the advert.
- Make a note of the date and time when you order the product.

BUYING BY POST

As with buying by phone, you should clearly state exactly what it is you are buying, at what price (refer to the magazine, page and issue number where it's advertised) and give any relevant information about your system set-up where necessary. You should also make sure you keep copies of all correspondence both to and from the company concerned.

MAKING RETURNS

Whichever method you buy by, you are entitled to return a product if it fails to meet any one of the following three criteria:

- The goods must be of 'merchantable quality'.
- The goods must be 'as described'.
- The goods must be fit for the purpose for which they were sold.

If they fail to satisfy any or all of the criteria, then you are then entitled to:

- Return them for a refund.
- Receive compensation for part of the value.
- Get a replacement or free repair.

When returning anything, ensure that you have proof of purchase and that you return the item as soon as possible after receiving it. For this reason it is important that you check the hardware or software as soon as it is delivered to make sure everything you ordered is there and works as it is supposed to.

HOW TO PAY

Paying by credit card is the most sensible way, whether buying in person, by post or on the phone, because you may be able to claim the money from the credit card company even if the firm you ordered from has gone bust or refuses to help sort out your problem.

Otherwise, you should pay by crossed cheque or postal order – never send coins or notes through the mail.

GETTING REPAIRS

Always check the conditions of the guarantee, and servicing and replacement policy, so that you know what level of support to expect. Always fill in and return warranty cards as soon as possible, and make sure that you are aware of all the conditions contained in the guarantee.

BUYING PD

Even though PD software is relatively inexpensive, you should still apply the guidelines set out above, making sure that you confirm all orders as clearly as possible.

Shopping around is still important when buying PD because different houses charge different prices for the same disks. There is no set pricing structure for disks, but bear in mind that PD houses are, in theory, supposed to be non-profit making operations. AS

A CHECK LIST FOR MAIL ORDER BUYING

1 **Make sure you know exactly what you want. Draw up a checklist of the specifications you are looking for and what you want it to be able to do. Check with the suppliers that their product matches your list**

2 **Will the product you have in mind work with your existing set-up, and anything else you are planning to buy?**

3 **Can you see a demonstration? Many products are on display at computer shows around the country.**

4 **Are there any hidden extras? Does it need 1Mb to run, or a hard disk?**

5 **What technical support is provided by the supplier? Does the manufacturer offer after-sales advice? Check before you buy.**

6 **Check the guarantee terms. How long is the free warranty? What does it offer?**

7 **Draw up a list of these details and make them a condition of your order.**

8 **Check the price and delivery details when you order, and make a note of them.**

9 **Note down when you placed the order and who you spoke to.**

10 **When it arrives, check everything carefully. If anything is missing, don't use the product at all – contact the supplier. If it doesn't work, make the obvious checks such as the fuse. If it still doesn't work don't try to fix it – contact the supplier.**

ADVERTISERS INDEX

Find your local group

If your group isn't mentioned, fill in the form at the bottom of the page to let us know about you

1520 Plotter Group (ICPUG) ☎ John Bentley 06286 65932

16-32 Micro Programming AMOS, bimonthly fanzine, PD, (Fish->590) Membership 100FF or £10 Contact F Moreau, 132 rue Jean Follain, 50000 Saint-Lo, France ☎ 31 52 20 02

Amiga Addicts Newsletter and open nights For info SAE to A Minnock, Clonkelly, Binn, Co Offaly, Ireland.

Amiga Artists Club 34 Roundhay Mount, Leeds LS8 4DW. For Amiga artists, musicians and coders. Pirates not welcome. Free. ☎ KAM on 0532 493942, 5-8pm

Amiga Athens club PD swaps, tips, cheats etc. Free membership, just new PD or tips in exchange for our services. Contact Stefanos Papamichael, 9 Derfeld Rd, Patisia, 11144 Athens, Greece. ☎ 01/2027973

AmigaBASIC club Free bi-monthly disk, help for beginners and experts. Membership £10 per year. Contact Conran Ahmad, 15 Weybridge Rd, Thornton Heath, Surrey CR7 7LN ☎ 081 689 9102

Amiga Beginners' Club 110 Whitehill Park, Limavidy, Co. Londonderry BT49 0QG. Club to help newcomers. Bi-monthly club disk, and a small PD library. Membership £2 for a single disk, or £20 for every issue

Amiga help club Contact John Kewley, Derlwyn, New St, Bethel, Nr C'von, Gwynedd, LL57 1YW. Meetings Mondays 7 – 10pm. Graphics, sound, Workbench, programming, help on any topic. Beginners welcome. Free membership

Amiga Helpline Contact Gordon Keenan, 21 Skirsa Place, Glasgow G23 5EE. Software/hardware help service, free PD, DTP problems sorted, plus general Amiga chit-chat. Send a stamp for full details. Membership £15 per year

Amiga Mania Bimonthly publication (tips, reviews, advice), licenseware, PD, discount software, hardware and accessories. Annual membership £10. Contact D Cryer, 88 Blackbull Rd, Folkestone, Kent CT19 5QS

Amiga Musicians' Club Membership gets you a disk with 50 IFF samples a month for 12 months. Also sample service. Membership £30. Contact Gavin Wylie, Guthrie Street, Carnoustie, Angus

Amiga Navigation Contact Dave Thomas 4a, Allister St, Neath, W Glamorgan. PD, advice, even small repairs and social evenings. Weds 7 – 9pm. Membership £10 per year

Amiga Network International 2 monthly club disk, reviews, advice. For info contact Phil or Steve: 434 Denby Dale Rd East, Wakefield, W Yorks WF4 3AE

Amiga PD Exchange at 27 Spa Rd, Preston, Lancashire, PR1 8SL. Chance to exchange PD, shareware, Fish and Tbag disks. £1 for disk and membership

Amiga Users' Klub, Windsor House, 19 Castle St, Bodmin, Cornwall PL31 2DX. Meets every Friday from 6.30-9pm, to expand members' knowledge of Amiga and to help solve people's problems. Contact Jack Talling

GET YOURSELF LISTED

If you run a user group which isn't listed on this page, fill in the form below for your free entry. Send it to *Amiga Shopper* User Groups List, 30 Monmouth Street, Bath BA1 2BW. We reserve the right to refuse entries.

AS21

Group name ....

Contact name ....

Contact telephone number ....

Contact address ....

....

....

Place of meetings ....

Time of meetings ....

Type of activities ....

....

Membership fee ....

Amiga User Group – FYLDE Contact Andy Wilkinson ☎ 0253 724607 25 Glen Eldon Rd, Lytham St Annes, Lancashire FY8 2AX. Meetings twice a month, newsdisk, tuition, technical support, Amiga advice Membership £15 per year

Amiga Users Club Contact Edward Metcalfe ☎ 021 7441430 49 Burman Rd, Shirley, Solihull, W Midlands B90 2BG PD swapping, games swapping (not copying), competitions, free membership

Amiga Video Producers' Group Meets quarterly in Swindon. For info SAE to J Strutton, 8 Rochford Cl, Grange Park, Swindon, Wilts SN5 6AB ☎ 0793 870667

Amiga Witham Users' Group 85 Highfields Rd, Witham, Essex CM8 1LW. Tips and Basic programs. K Anderson ☎ 0376 518271

Amigaholics Club Free membership. Own disk magazine. For further information contact Kevin Bryan ☎ 071-580 2000 Ext 240 or write to 29 Wolfe Cres, Charlton, London SE7 8TS

Amigamania Bi-monthly newsletter (tips, advice etc), quality PD, discount hardware, software and accessories, free advice. Discount card for High St shops. Annual membership fee £10. Contact S Green, 9 St Lukes Walk, Hawkinge, Kent CT18 7EF

Amigos PD Large PD library – £1 for catalogue disk. Contact Roland Arnold, 16 Mayfair Ave, Ilford, Essex IG1 3DL ☎ 081-554 5160

Amos Programmer Club Free membership, swap AMOS programs and PD, disk magazine and help for new users. Contact Gareth Downes-Powell, 6 Brassey Avenue, Broadstairs, Kent CT10 2DS

AMOS Programmers' Exchange Free membership. Swapping software and ideas. Help available. J Lanng, 7 Majestic Rd, Hatch Warren, Basingstoke, Hants RG22 4XD

AMOS Programmers Group John Mullen at 62 Lonssdale St, Workington, Cumbria CA14 2YD. Hints, tips, tutorialse tc. SAE for info. £10 membership for bi-monthly disk mag

Angus Amiga CDTV club Contact J Robertson, 22a High St, Brechin, Angus DD9 6ER ☎ 0356 623072. Review software, discuss anything Amiga. Free membership

Asia Amiga Association Newsletter, PD, information, advice, ideas, exchanges. Membership HK$250 per annum. For more info contact Pete Alex, Room 11c, Fortune Court, 4–6 Tak Hing St, Kowloon, Hong Kong. ☎ 7245196

Astro PD Send SAE and blank disk for catalogue. Help and advice also available. Contact D Benson, 3 Skiddaw Court, Nunthorpe, Middlesborough, Cleveland TS7 0RD

Avon Micro Computer Club Graphics and animation, business and the chance to speak to professional users. £3 per annum. Contact Roger: 95 Downend Rd, Horfield, Bristol ☎ 0272 513224

Basic Programmers' Group 68 Queen Elizabeth Dr, Normanton, West Yorks WF6 1JF. Encourages the use of Basic, exchanges ideas and assists beginners to the language. Free newsletter Mark Blackall ☎ 0924 892106

Beaconsfield and district CC Contact Philip Lishman ☎ 0494 782298 27 Russell Court, Chesham, Bucks. Meetings at St Michaels Hall, St Michaels Green, Beaconsfield 7.45 – 9.45pm. Programming, gaming swapping PD, having fun. Membership £10 for 6 months

Bloomfield video and computing Contact Mrs Beryl Hughes ☎ 0267 2357522 Nashville, 50 Glynderi, Carmarthen, Dyfed SA31 2EX. Meetings at the Bloomfield Community Centre, 7.30pm alternate Tuesdays. Amiga for beginners, video techniques etc. Membership £5

BR & CJ Computer Club B Robinson at 23 Fairway Rd, Shepshed, Loughborough, Leicestershire, LE12 9DS ☎ 0392 72889 or 03922 841296. Regular disk mag packed with tips, reviews of games and serious software, game cheats database, demos and utils, very large PD library. Membership fee £1.25

Bus Stop PD 75p per disk, send SAE and 50p for catalogue including classifieds and messages section. C Chester, 5 Westbourne Road, Marsh, Huddersfield, HD1 4LQ

Cacophony (Unlimited) Aims to create quality PD with AMOS and others. Help given. Mark Wickson, 49 Perrott Close, North Leigh, Witney, Oxon OX8 6RU

Camberley User Group Lectures, competitions, advice, meetings, free membership. For more info contact F Wellbelove ☎ 0252 871 545

Champion PD Club PD at 30p, newsletters, advice, help and more. Membership £10. Contact Steve Pickett, 31 Somerset Close, Catterick, N Yorkshire, DL9 3HE

Cheapo PD Club Non-profit making postal PD, newsletters, advice. Membership £5. Contact Jason Meachen, Ivy Cottage, Chapel Road, Beaumont, Clacton, Essex CO16 0AR.

Chester-le-Street 16-Bit Computer Club Ground floor function suite, The Civic Centre, Newcastle Rd, Chester-le-Street. Meets Mondays from 7.30- 9.30pm. Exchange advice and swap tips. ☎ Peter Mears 091 385 2939

CDTV Users Club Swap views on software and hardware. Contact Julian Lavanini, 113 Fouracres Rd, Newall Green, Manchester M23 8ES

Chic Computer Club Full details with an SAE to STAMP, Chic Computer Club, PO Box 121, Gerrards Cross, Bucks. For info contact Steve Winter ☎ 0753 884473

Club 68000 Competitions, programming, music. Meets Harrogate Leisure Centre, Mondays 6.15pm-10pm. SAE to Chris Hughes, 59 Walton Park, Pannal, Harrogate, N Yorks, HG3 1EJ ☎ 0423 891910

Club Amiga £10 a year for PD and a 24-hr helpline service (091-385 2627). For more

info send SAE to Chris Longley, 5 Bowes Lea, Shiney Row, Houghton Le Spring, Tyne and Wear

Club Futura Advice to programmers and beginners. Send SAE for info to G Holland, 16 Hermiston, Monkseaton, Whitley Bay, Tyne & Wear NE25 9AN

Comp-U-Pal Australian group for users in the outback. Newsletter, helpline, PD library. Membership A$24. Comp-U-Pal, c/o MDA, PO Box 29, Knoxfield 3180, Victoria, Australia

Computeque Steve Lalley at Inskip Meeting Hall, Ashurst, Skelmersdale, Lancs on 0695 31378 7.45pm – 10.30 pm every Tuesday. From beginner to advanced user. Half year membership £2.50 children, £3 adults

Computer Club 16 Laton Rd, Hastings, East Sussex ☎ 0424 421480. A 16-bit club dedicated to being computer enthusiasts Membership costs £15 per year

Darlington Commodore Users Club News, discounts, cheap PD, advice, newsletter and more. Annual membership £5. For further info contact S Wheatley, 1 Ruby St, Darlington, County Durham DL3 0EN

Deluxe Cheats Disk User Group Steven Frew at 96 Campden Green, Solihull, West Midlands, B92 8HG. Software advice. Updates every 2 months! £4 for disk £2 for updates

Edinburgh Amiga Group Membership £5, includes free advice and PD. Contact Neil McRea, 37 Kingsknowe Road North, Edinburgh EH14 2DE with SAE

Enfield Amiga club For info contact Sean Clifton ☎ 081 8042867 32a Hoe Lane, Enfield, Middx Meet, swap, competitions, helping new users with problems

Enterprise PD 'Free' PD if you supply disks and postage. Membership £25 per year, £5 per month. T McLoughlin, 229 Barking Road, East Ham, London E6 1LB ☎ 081 472 0434

Eureka PD Small library with friendly service. 70p per disk. Contact Liam Allen, 5 Hartwell Close, Northampton NN2 8TT

Exeter 16 Bit User Group Andrew Deeley or Phil Treby at 25A Gloucestershire Rd, Exwick, Exeter, EX4 2EF. Meeting every Wednesday 7pm. Programming £6 per annum

Galactik PD Swaps and sells PD. Contact E Newsome, 10 Crugan Ave, Kinmel Bay, Clwyd LL18 5DG. Demos, music, utilities, games, 99p for catalogue disk

GFA Basic Forum Contact J Findlay ☎ 0788 891197 or send SAE to 52 Church Rd, Braunston, Nr Daventry Northants NN11 7HQ. Free advice on programming in GFA. Also tutorial disk for sale. Beginners and advanced users welcome. Free membership

Gibraltar Amiga Users Club PD library, monthly newsletter, disk magazine, competitions, regular meetings (in the John Macintosh Hall). Membership from £6 per year. Contact David Winder, 7 Lime Tree Lodge, Montagu Gardens, Gibraltar ☎ 010 350 79918

Guru Masters PD demos etc, contact the Sheriff, 111 Sherbourne Rd, Banbury, Wolverhampton, WV10 9EU ☎ 0902 782277

Hampshire PD Club Mike Gallienne at 79, Carless Cl, Rownes, Gosport, Hants, PO13 9PW on 0705 585323. Public Domain Disks at 35p. Competitions once a month. Send an SAE for more info to the above address. £10 a year

Hereford Amiga Group Membership free, help, exchange of PD and shareware. Lotus Turbo 2 Quad Player Championship. Contact John Macdonald, Alma Cottage, Allensmore, Hereford HR2 9AT ☎ 0981 21414

Hermit Computer Club Hardware help and information, program swapping. Meetings 7-10pm, Mondays. Membership £3 per term, 50p per night. Contact John Maynard, Hermit Centre, Shenfield Road, Brentwood, Essex CM15 8AG ☎ 0277 218897

Hornesoft PD Over 2000 Amiga PD from 20p to 69p. Send SAE for free disk catalogue. Contact Chris Horne 23 Stanwell Cl, Wincobank, Sheffield S9 1PZ

HTS (Malta) Free membership. Contact K Cassar, Block 1 Flat, 6 H E Hal-Tmiem, Zejtun ZTN07 Malta ☎ 674023

Hyndburn Amiga Users Club Tuition, advice, PD, and more. Meets Mondays, 7pm, at the Canine Club, Accrington (£1 on the door). Contact Nigel Rigby, 7 Brecon Avenue, Oswaldtwistle, Lancashire BB5 4QS ☎ 0254 395289

In Touch Amiga Penpals, contacts, PD, swaps £2.50 per year. For more information contact P Allen, 0342 835530, PO Box 21, Lingfield, Surrey RH7 6YJ

Independent Commodore Products Users' Group Biggin Hill Library, Church Rd, Biggin Hill, Kent. Meets most Thursdays from 7.45-9.45pm. Lectures and open nights. ☎ John Bickerstaff after 8.30pm 081-651 5436. Also national network of user groups. Contact individual groups for details on activities, cost, meetings etc:
Andover ☎ R Geere 0264 790003
Anglesey ☎ N Massey 0407 765221
Coventry ☎ W Light 0203 413511
Dublin ☎ G Reeves 010 353 12 883863
Leeds ☎ R Eyre 0532 487691
Macclesfield ☎ P Richardson 0298 23644
Merseyside ☎ G Titherington 051 521 2553
Mid Thames ☎ M Hatt 0753 645728
S Wales ICPUG ☎ I Kelly 0222 513815
Solent ☎ A Dimmer 0705 254969
SouthWest ☎ P Miles 0297 60339
Stevenage ☎ B Grainger 0438 727925
Watford ☎ B Rigby 0923 264510
W Riding ☎ K Morton 0532 537318
Wigan ☎ B Caswell 0942 213402

JJC Amiga correspondence course £50 per year. Contact PO Box 19, High Wycombe, Bucks HP11 1UF. ☎ 0494 983347

Kent Youth Computer Group Contact Jim Fanning ☎ 0233 629804 North Youth Centre, Essella Rd, Ashford, Kent. Meetings at the North Youth Centre, Thursdays 7 – 10pm computer fair visits, video and DTP work, monthly newsletter Membership 40p per month

Lothian Amiga Users Group Contact Andrew Mackie ☎ 0506 630509 52 Birniehill Ave, Bathgate, W Lothian EH48 2RR Advice and help in buying hardware, software etc, group buying, dealers' circulars welcome. Membership free

Maritime Amiga Club Maritime computing, interact with seafarers ashore on Amigas. Contact CDR K Osei, GN Ships Refit Office, 51 Rue de la Bretonniere, 50105 Cherbourg, France. ☎ 33 33225447

Marksman (Trojan Phazer user group) Contact David Green, 67 Thicket Drive, Maltby, Rotherham, S Yorkshire S66 7LB Promotes use of the Trojan Phazer, swaps PD and own programs, disk magazine

N Ireland Amiga User Contact Stephen Hamer, 98 Crebilly Rd, Ballymena, Co Antrim BT42 4DS. Disk based mag £2.50 per issue. Free PD, SAE for further info

Norwich Masked Heros SAE for info. Free membership. Contact Zorro, 278 Aylsham Rd, Norwich, Norfolk NR32RG ☎ 0603 409899

Pennine Amiga Club 26 Spencer Street, Keighley, West Yorkshire BD21 2BU. Free membership, free advice and a newsletter. Contact Neville Armstrong for more info ☎ 0535 609263

Perth and District Amateur Computer Society For further information contact Alastair MacPherson 137 Glasgow Rd, Perth. Meetings third Tuesday in every month, 8pm. General advice, talks, Amiga PD. Membership £6 or free for under 16s

Pete's PD PD from only £1 per disk. Send 50p for disk catalogue to Peter Garrett, Chestnut Cottage, White Lion Road, Amersham, Bucks HP7 9JR

Public Domain Exchange Demos, music, utilities, animation. Annual fee £8 Contact D McLeish, 26 Taunton Ave, Leigh, Lancs WN7 5PT

Public Domain User Group Swaps PD, provides advice. SAE to 12 Oxford Rd, Guildford, Surrey

PUG Contact S Jackson ☎ 0446 772331 Whitebeam Cottage, Trerhyngyll, Cowbridge, S Glamorgan Cheap PD library, swap hints, reviews, articles etc. Send an SAE for further details

Redburn Computer User Group Contact Paul Armstrong ☎ 0294 56003, 12 Highfield St, Kilwinning, Ayrshire KA13 7BN. Meetings at the Redburn Community Centre, Dickson Drive, Irvine. Group meets every second Wednesday from 5 Aug 92, 6.45 – 9.30pm. Help, ideas, PD and shareware, graphics and business. Membership 75p per meeting; £7 per year

Rye Computer Club Swap/meet at the Rye Community Centre. For info contact Oliver Campion, 71 The Mint, Rye, E Sussex TN31 7DP ☎ 0797 222876

Serious Amiga Users Membership £5, £1 admission. Contact J Kucak for more: ☎ 0706 290387. Fortnightly meetings 7.30-11 at the High Crompton Conservative Club

Shieldsoft PD at Wilmar Lodge, 13 Churton Rd, Rhyl, CLwyd.LL18 3NB. Write for more information. Basic programming help. Advice on the CLI and AMOS. Disks from only 50p to 80p. Membership free ☎ 0745 343044

Sherlock PD Quarterly disk mag, help and advice for beginners. 50p per disk. A Doyle, 44 Milton Street, Warrenpoint, Co Down, N Ireland

Shropshire Amiga Link Advice, monthly disk mag, PD £15 per year fee. Contact N Cockayne, 2 Dodmoor Grange, Randlay, Telford, Shropshire TF3 2AW ☎ 0952 591376

Slim Agnus 115 Brocks Drive, North Cheam, Sutton, Surrey SM3 9UW. Group meets the last Thursday of every month. PD library, BBS, advice from Amiga experts. Contact Philip Worrel.

Software City Swapping, competitions, club magazine. Membership £8. Contact N Richards, 9 Hollis Close, Manor Estate Farm, Rawmarsh, Rotherham, S Yorks S62 7LX or ☎ 0709 526092

Software Exchange Club Free help and advice. Contact Michael Lacey, Fern's Post Office, Enniscorthy, County Wexford, Republic of Ireland

Software Exchange Service 13 Bournville Lane, Stirchley, Birmingham, West Midlands B30 2JY. For more info ☎ Michael Pun 021-459 7576

South 16 Bimonthly mag and disk, also PD library. SAE for more info. £10 per year. Contact Bruce, PO Box 16, Southampton S09 7AU

Southend Team Music, PD. Free membership. Contact Scotty, 52 Prince Avenue, Southend-on-Sea, Essex SS2 6NN ☎ 0702 333974

Southport Amiga Users Advice, friendly evenings Mondays at 8pm. No charge, discounts from local store. For info contact Michael Mitcham, 5 Easdale Drive, Ainsdale, Southport, Mersyside ☎ 0704 79936

South Wales Club Newsletter, PD library, free newsletter, programs, help and advice. For more info contact D Allen 53 West Avenue, Trecenydd, Caerphilly CF8 2SF

Steel PD, cheats, ideas, music, art, programming, hardware mods. Free membership (postal only). Contact James Whitehead, 33 Middle Cliffe, Drive Crowedge, Sheffield S30 5HB

Twilight Advice on hardware and software,Fred Fish PD. Free membership, disks 50p each. Contact 13 Mavis Court, Ravens Close, London NW9 5BH

Unique Styles Derek at 15 Montgomery Rd, Highbrooms, Tunbridge Wells, Kent ☎ 0892 518319. By post only. For Amiga artists, programmers/musicians. Free membership

Video and Computing Society Contact Beryl Hughes, Nashville, 50 Glynderi, Dyfed SA31 2EX ☎ 0267 237522

Video Visuals Exclusively for video producers, PD library, genlocking, digitising, quarterly disk magazine. Membership £10 per year. Contact Chris Brown, 4 Lavender Close, Witham, Essex CM8 2YG

Wardray Hern Consortium User group of user groups for Amiga and possibly others. Membership fees to be discussed and incurred. PD library to be set up. Also Hern connection – worldwide contacts wanted. SAE and disk to WardCon info, (AS) Warren Hardy, 21 Stockfield Ave, Fenham, Newcastle upon Tyne NE5 2DX

Warpdrive Help-line, PD library, bi-monthly disk mag, free drinks, competitions and infosheet. £15 per year. Contact B Scales 110 Burton Ave, Balby, Doncaster DN4 8BB ☎ 0302 859715

WCSPSA! Help available. PD disk of your choice and newsletter every month. PD at £1. Membership £25. For further info contact A Jamieson ☎ 0749 677609

Wrexham District Computer Club PD, library, equipment loan. 10p to join, 50p to get in. Meetings at the Memorial Hall, Wrexham every Thursday, 7-10pm. Contact Paul Evans, 3 Ffordd Elfed, Rhosnesi, Wrexham, Clwyd LL12 7LU

Your Amiga Club Helplines, PD, social evenings, classes, club mag. Fee: £12, family £15. Contact P Higgins ☎ 0424 892269. The Old Chapel, Church Rd, Catsfield Battle, Sussex TN33 9DP

Zymurgy General Amiga computing. Free membership. For further info contact A Carr, 39 Sewlkirk Rd, Ipswich, Suffolk IP4 3JB ☎ 0473 725241

PRODUCT LOCATOR

PUBLIC DOMAIN • PUBLIC DOMAIN • PUBLIC DOMAIN • PUBLIC DOMAIN • PUBLIC DOMAIN • PUBLIC DOMAIN

Welcome to the *Amiga Shopper* Buyer's Guide, your regular guide to what's hot and what's not in the Amiga market place. It's designed as a simple-to-use yet comprehensive guide which will help you to make the right buying decisions. The Buyer's Guide will run each and every month and as new products are released and others discontinued, we'll be updating it accordingly. This month we bring you what is possibly the most comprehensive guide to software for the Amiga owner which is all available in the public domain. It may not include each and every PD product ever produced for the Amiga (that would take up virtually the whole of *Amiga Shopper*!), but rest assured that all the major titles are here.

Program	Library	Disk	Type	Issue	Rating
BUSINESS SOFTWARE					
TextPlus 3.0	PDSoft	V261	Word processor	1	****
TextEngine 3.0	Digitz	277	Word processor	13	***
WordWright	PDSoft	V28	Word processor	13	****
AZSpell	Digitz	Utl277	Spell checker	13	****
PowerSnap	Fred Fish	542	Grab screen text as ASCII file	8	*****
UEdit	AmigaNuts	1162	Text editor	8	****
AmigaFox	Office Choice	U173	Combine text with graphics	8	**
AmiBase Pro 3	AmigaNuts	–	Powerful database	9	****
Liner Fred Fish	285	Ideas processor like Flow	10	****	
NewPRT	Digitz	149	Printer drivers for PageStream	10	****
PageStreamFonts	Digitz	149	Fonts for PageStream	10	*****
EasyBanker	GTS	Home2	Home finance program	10	****
HomeHelp	GTS	Home1	Computerised grocery lists	10	****
I-Man	GTS	Home2	Inventory list management	10	***
MultiPlot	Fred Fish	467	Data graphing program	7	****
Power Planner	Deja Vu	Licenseware	Diary/telephone book	15	***
Power Base	Deja Vu	Licenseware	Database	15	*****
Cruiseword	PD Majik	–	Word processor	16	**
AmiCash	PS Soft	V630	Home accounts	16	***
Home Manager	PD Soft	V660	Personal organiser	16	*****
Word Power	Deja Vu	Licenseware	Spell checker	17	****
WBase	Anglia PD	U4015	Pop up Worbench database	18	**
PowerText	Deja Vu	Licenseware	Word processor	18	*****
Account Master	Various	–	Home accounts program	19	****
AmigaDex	PD Soft	V757	Pop up address book	19	*****
Will&Testament	PD Soft	V706	Template for Wils	19	*****
MUSIC UTILITIES					
MED 3.11	AmigaNuts	973	Sound Tracker	1	*****
Module Processor	AmigaNuts	864	Convert modules to executable	1	***
Rippers Disk	17Bit	1055	Rip modules from memory	5	****
Sound Ed	Fred Fish	486	Sample editor	5	****
Module Master	TBAG	58	Play modules in various formats	9	****
K1 Editor	Fred Fish	332	Patch editor for Kawaii K1	10	*****
CZED	Fred Fish	223	Patch editor for Casio synths	10	*****
Desktop Harp	Various	–	Collection of tunes	18	*****
EMULATORS					
IBEM	VirusFree	1485	PC compatibles	3	****
A64	AmigaNuts	1030	Commodore 64	3	*****
ST Emulator	Digitz	Utl149	Atari ST	15	***
QL Emulator	AmigaNuts	1030	Sinclair QL	3	***
ZX Emulator	AmigaNuts	1030	ZX Spectrum	3	****
VARIOUS UTILITIES					
A-Gene	AmigaNuts	933	Geneology program	1	****
Command.COM	17Bit	866	CLI commands in RAM	2	***
MessySID 2	PDSoft	V490	Access PC disks with ease	13	*****
Elements	Fred Fish	593	Periodic table of elements	13	****
Cass 1.1	Fred Fish	579	Make your own cassette covers	13	***
Badger	Fred Fish	543	Event scheduler	13	***
School TimeTable	AmigaNuts	1100	Generate school timetables	5	***
Arq	CIX Download	–	Improved system requesters	8	*****
LC24-200 Fonts	NBS	L503	Fonts for Star printers	8	****
Menu Runner	AmigaNuts	1024	Run programs from menu	8	***
ButExchange	Fred Fish	494	Reverse mouse buttons	9	****
DeafLab	Fred Fish	494	Sign language utility	9	***
PWKeys	Fred Fish	494	Manipulate windows with hotkeys	9	***
InputLock	Fred Fish	494	Turn off mouse and keyboard	9	****
RunMe	AmigaNuts	1186	Run programs from menu	9	*****
Hard Drive Special	GTS	–	Collection of hard drive utils	9	*****
ScreenMOD	TBAG	58	Modify screens and windows	9	***
Words 3	AmigaNuts	–	Solve anagrams	9	***
ClockTick	TBAG	58	2.0-like clock mouse pointer	9	****
FileSearch	Fred Fish	531	Find files on a hard disk	11	***
Format 1.1	Fred Fish	535	Replacement disk formatter	11	*****
PowerPacker Utils	Fred Fish	542	Utilities for PowerPacker	11	***
LabelMaker	Fred Fish	548	Create disk labels	11	***
ToolsDeamon	Fred Fish	561	Run programs for 2.0 Tools menu	11	****
Filer	Fred Fish	562	SID clone for Workbench 2.0	11	****
AWP Fred Fish	554	Animate WB2.0 clock pointer	11	****	
RMBShift	Fred Fish	547	Select multiple icons	11	****
Smart Icon	Fred Fish	316	Iconifies windows	10	***
Flash Disk	GTS	Utils2	Disk optimizer	10	****
Snap 1.4	Fred Fish	326	Grab screen text into clipboard	10	****
SysInfo	Fred Fish	571	System information program	11	*****
MKSLens	Fred Fish	574	Magnify area of screen	11	***
Font Manager	Digitz	149	Manage your bitmap fonts	10	****
Recover	Digitz	149	Rescue files from corrupt disks	10	***
Track Display	GTS	Utils1	Shows position of drive heads	10	***
FastDiskII	GTS	Utils1	Disk optimizer	10	***
FileMaster	GTS	Utils1	Binary file editor	10	*****
DiskSpeed	GTS	Utils1	Disk drive benchmark program	10	****
Formatter	GTS	Utils1	Replacement disk formatter	10	***
SetNoClick	GTS	Utils1	Turn off annoying drive click	10	***
DevRen	GTS	Utils1	Rename devices including DF0	10	****
LockDevice	GTS	Utils1	Better AmigaDOS 'Lock' command	10	****

PRODUCT LOCATOR

Label Print	Fred Fish	227	Disk label printer	10	***
Banner	TBAG	52	Print huge banners	10	****
Avail Mem	Fred Fish	285	Graphical memory monitor	10	***
DCopy	AmigaNuts	700	Disk copier	10	****
MessyDOS	NBS	U619	Read and write PC disks	6	*****
Master Virus Killer	AmigaNuts	971	Virus killer	1	****
Imploder	Fred Fish	422	File compressor	7	***
ARTM	17Bit	1274	System monitor	7	*****
File and HD management	PD Soft	V573	Hard drive utilities	15	*****
Sid 217Bit	–	Directory utility	16	*****	
File and HD management 2	PD Soft	V575	More hard drive utilities	16	***
Outline fonts	George Thompson	–	For ProPage and PageStream	16	*****
Electronic baby book	PD Soft	V658	Record your baby's details	16	****
Astro 22	PD Soft	V685	Astrology program	17	****
Touch typing tutor	NBS	CLU03	Teach yourself touch typing	17	****
Magnetic Pages	PD Soft	V688	Create your own disk magazine	17	*****
HAM Radio	Aardvark PD	–	HAM radio utilities	18	****
MegaStation	Five Star PD	U195	More CLI commands	18	***
C Commands	PD Soft	V586	Even more CLI commands	18	***
Morse Tutor	Deja Vu	L101	Teach yourself Morse Code	19	*****
Minix Demo	PD Soft	V711	Demo of Unix-like OS	19	*****
Printer Drivers	PD Soft	V724	Star and Canon printer drivers	19	*****
Icon Mania	PD Soft	V730	Lots of new icons	19	**
Anti-Virus	Soft Expression	U155	Kill those viruses	19	*****
CG Fonts	PD Soft	V713	Lots of Compugraphic fonts	19	****
X-Stitch	Deja Vu	Licenseware	Pics to knitting patterns	19	****
Distance	Deja Vu	Licenseware	HAM radio utility	20	****
Main Event	Soft Expression	U149	Event scheduler	20	****
Disk Manager 2	Various	–	Disk cataloguing program	20	****
VCR Tape Filer	Fred Fish	721	Organise your video collection	20	***
AniMan	Fred Fish	722	Voice control your Amiga	20	***
DiskMate	Fred Fish	723	Disk copier	20	*****
BackUp	Fred Fish	724	Hard disk back-up utility	20	*****
HAMLab 2 Demo	Fred Fish	726	Powerful image processor	20	*****

COMMS UTILITIES

LHA 1.11	Fred Fish	593	Archiving utility	13	****
Phone Line Watcher	TBAG	58	Keep track of phone bill	9	****
Term 1.8A	Fred Fish	534	Terminal Program for WB2.0	11	*****
NComm	17Bit	1275	Terminal Program	7	****
BBBBS	Fred Fish	729	Bulletin Board System	20	****

PROGRAMMING UTILITIES

DICE Fred Fish	443	C Compiler	3	*****	
Copper Master	AmigaNuts	1083	Generate Copper Lists	5	***
BRef Fred Fish	494	BASIC cross referencing utility	9	****	
Power Logo	EdLib	24	Enhanced Logo Interpreter	9	***
MIDI Library	Fred Fish	227	Program MIDI applications	9	*****
PCQ Pascal	AmigaNuts	1113	Pascal compiler	6	****
NorthC	AmigaNuts	1112	C Compiler	6	****
Acc Assembler	AmigaNuts	–	Fast Assembler	6	*****
Remm and Rams	Deja Vu	Licenseware	Map editor and scroller utilities	17	***
Frac	AmigaNuts	1251	Adventure game creator	18	****
Map Editor	AmigaNuts	–	Map editor for AMOS	19	****
DPU	Fred Fish	721	Hex disk and file editor	20	****

GRAPHICS UTILITIES

SpectraPaint	Slipped Disk	19	Paint package	3	****
Deluxe Draw	Slipped Disk	18	Paint package	3	**
AMOS Paint	Deja Vu	83	Paint package	3	***
HAMLab	AmigaNuts	1149	Image processing	3	**
3DFont	17Bit	1007	Text to Sculpt Object	3	***
SkyPaint	TBAG	37	Text-based graphics	3	***
SlideShow Kit	VirusFree	1465	Create your own slideshows	3	****
Mandel Mountains	Softville	751	Creates 3D Mandelbrots	5	****
3D Objects Disk 1	AmigaNuts	–	Collection of Sculpt Objects	8	****
PictSaver	Fred Fish	543	Grab screens in IFF Format	9	*****
LandBuild	AmigaNuts	1190	Fractal landscape generator	9	**
Video Text Displayer	AmigaNuts	1199	Basic text scroller	9	***
Converters	17Bit	1221	Image conversion tools	9	***
Vector Designer	AmigaNuts	–	Vector graphics designer	9	**
Plasma	Fred Fish	573	Fast fractals program	11	***
BezSurf 2	Fred Fish	315	Create shaded 3D objects	10	***
DrawMap	Fred Fish	315	Generate maps of the world	10	***
Sprite Designer	AmigaNuts	1102	Create animated sprites	6	**
ImageLab	PDSoft	V518	Image processing program	12	****
Desktop video pack 2	Anglia PD	–	Various DTV utilities inc titler	17	***
FracScape	Various	–	Fractal landscape generator	18	*****

EDUCATIONAL SOFTWARE

Learn&Play	Riverdene	Mis637	Maths/Reflex/Logic	5	****
Simon	Deja Vu	APD135	Reflex/Memory	5	***
Space Maths	Deja Vu	APD135	Maths	5	****
TouchStones	Deja Vu	LPD18	Logic	5	****
Shapes	Riverdene	GAM907	Maths/Logic	5	****
Quingo	Deja Vu	LPD21	3 'R's	5	***
Treasure Search	Deja Vu	APD2	Maths/Logic	5	***
JigMania	Deja Vu	LPD13	Maths/Logic	5	****
Spell4Fun	AmigaNuts	1146	Spelling	9	****
Maths4Fun	AmigaNuts	1146	Maths	9	****
XTables	AmigaNuts	1146	Maths	9	*****
Runes	DTP	OS125	Mystic runes explained	18	***
4 Stroke Engine	PD Soft	V738	Demonstrates 4 stroke engine	19	****
Complete Bible	PD Soft	V715-717	Complete Bible on three disks	19	****
Constellations	Astronomy News	–	Info on stellar constellations	20	***
Maths Reflex	Anglia PD	C728	Test your maths	20	****

FOR SUPPLIER INFORMATION ON ALL THE PRODUCTS LISTED ABOVE SEE UK PD HOUSES PAGE 163

WIN • WIN • WIN • WIN • WIN • WIN • WIN • WIN

Enter the New Year with a new A1200

Gordon Harwood Computers, God bless 'em, have given us a spanking new A1200 to give to one of you lucky souls out there

Well, the A1200 is something to write home about, and no mistake. Certainly the most exciting arrival on the Amiga scene this year, it's probably the best thing to have happened since the Amiga's launch. And you should have seen how quickly they were selling at the Future Entertainment Show.

Thanks to Gordon Harwood Computers, we have £399 worth of saliva-inducing competition prize up for grabs.

Have a go at the three questions in the panel, jot your answers along with your name and address on the back of a postcard, and send it to:

The 1200th day of Christmas
Amiga Shopper
29 Monmouth Street
Bath BA1 2DL

The closing date is January 8. Only one entry per household, please.

THE CHALLENGE

QUESTION 1

What's the name of the new graphics mode with over 256,000 colours?
a) HAM
b) Extra Brite HAM
c) HAM 8

QUESTION 2

How much memory comes as standard with the A1200?
a) 1Mb
b) 2Mb
c) 4Mb

QUESTION 3

On the first day of Christmas, what did my true love give to me?
a) A partridge in a pear tree
b) An A1200
c) A 'Dear John' letter



The A1200 – the newest Amiga around

WIN! WIN! WIN!

ARE YOU A WINNER?

We have two lots of competition results to announce this issue because, er, we forgot to announce some of them last month. The winners of October's Anodyne Accountancy... *Not!* compo are: Dominic Clancy of Dungarvan, C Millar of Dumfries, AR Greenway of Fareham, Steven Lee of Crawley, Juan Arquillos of Spain, Mike Carey of Aberlady, RJ Cole of Bristol, Martin Beach of Waterlooville, GLH Newton of Laverstock and P Carr of Nailsworth. The winners of November's Racey Chasey Heart compo are: Gary Leach of Leeds and I Brotherston of Stratford. The runners-up are: N Lightbody of Lindfield and DP Davies of Birmingham. Congratulations to each and every one of you – your prizes are on their respective ways.

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• NOTE TO NEWSAGENT: *Amiga Shopper* is published by Future Publishing (0225 442244) and is available from your local wholesaler.

• PS Oh, and if you do have any problems getting hold of your favourite Amiga mag, call Kate Elston on 0225 442244 and she'll help you out.

IN NEXT MONTH'S FACT-PACKED ISSUE

● Our definitive printers round-up. Jeff Walker and Jason Holborn examine the hardcopy options available to you, including lasers, bubblejets and dot matrix printers.

● Do It Yourself hardware repairs. Wilf Rees pin-points the most common hardware problems and shows you how to solve them without incurring heavy repair bills.

● Toby Simpson takes an in-depth look at the new Amigas and Workbench 3. Are they significantly more powerful than their predecessors? And do you really need to upgrade?

Plus regular columns on Amiga Answers, public domain, video, AmigaDOS, desktop publishing, programming, education, business and much more

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